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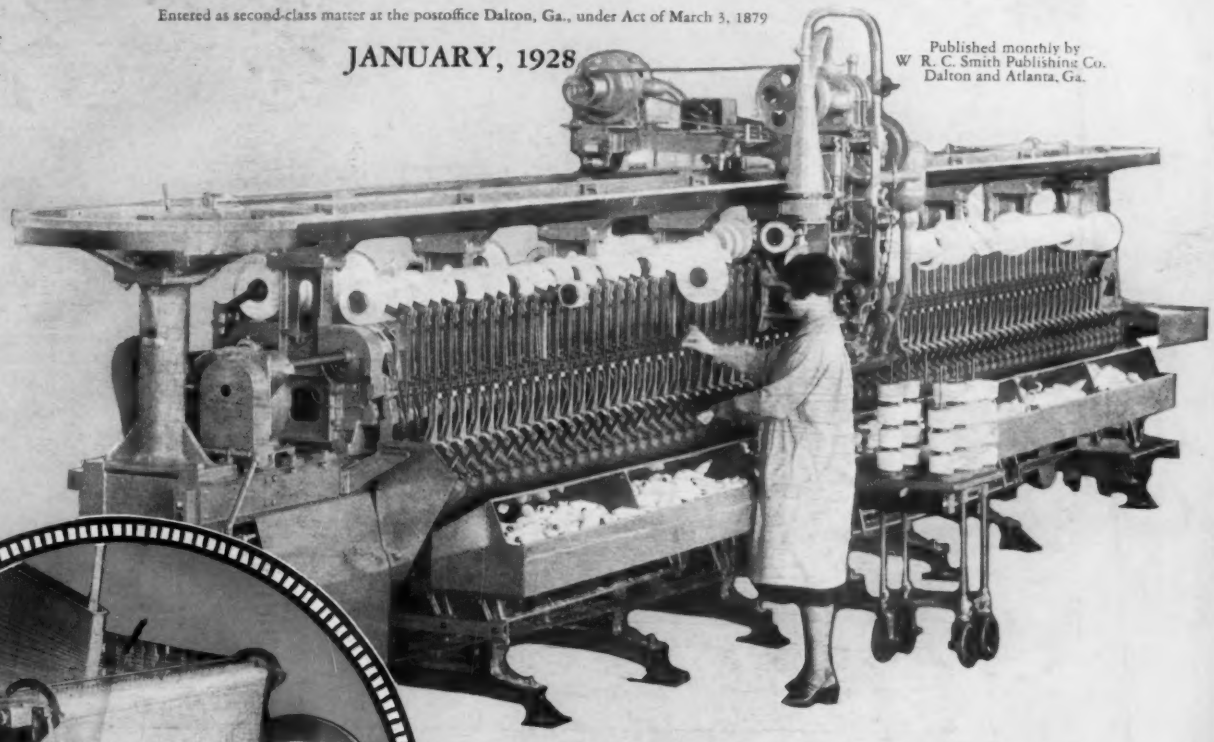

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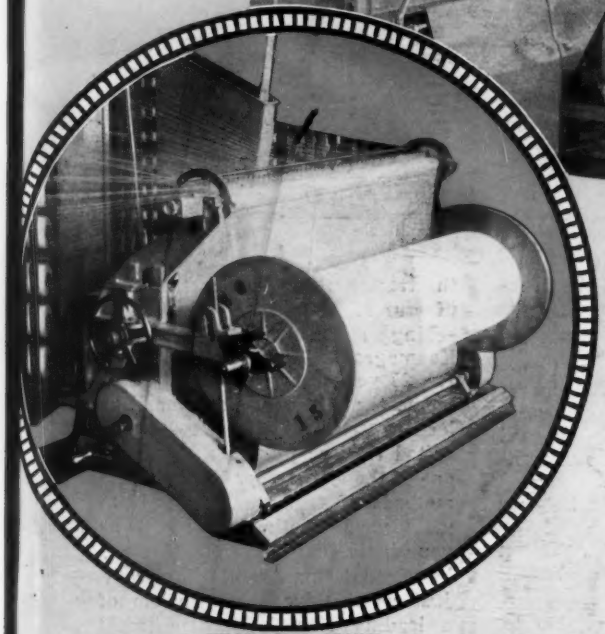

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CONTENTS

Among COTTON's Readers 65
With the Publishers— 69

GENERAL AND TECHNICAL—
Opening and Cleaning Cotton 223
Installation of Whitin Equipment at Pell City.. 226
Milstead Mfg. Company has Centrif-Air Unit.. 227
An H. & B. Installation for Wide Cotton Range 228
The "Whirlwind" System—by Woonsocket..... 230
A Murray Application at Lowell, N. C. 231
Georgia-Kincaid's Saco-Lowell Lay-Out 232
Wages 234
The Art of Observation 237
Finishing Linen Cloth and Toweling 239
Creating a Safety Mind 241

CURRENT TOPICS—
Government in Business 242
Business and the Presidency 243
Ten Years of Bolshevism 243
The Supreme Senate 244
A New Type of Arbor for Roving and Spinning Frame Rolls 245
What the Southern Mills are Doing 245
New England Mill Situation 246
Cotton Comment 254
Notes About Men You Know or Know About.... 256
An Old-Timer Says— 259

HOW OTHER MEN MANAGE—
Desires a Remedy for Static 261
Bleaching a Blue-Gray Sheeting 261
What is the Life of a Quill 261
Wants a System for Numbering Looms 263
Wavy Places in Weaving Sheetings 263
Why Do the Selvage Ends Twist? 264
Warp Tyers to Aid Loom Fixers 264
How Should Trumpet Bore Sizes Be Determined? 269
End Breakage in Spinning 269
Picking Warper Tenders 270
How Can the Breaking Strength Be Improved?.. 270
A Spinning Room Kink 270
Causes of End Breakage in Ring Spinning..... 275
Belt Slip 275
Causes of Streaks and Shiners and in Rayon Fabric 276
Cracked Selvages 277
The Incentive of Promotion 282
The Man for the Job 285
Reducing Waste in the Mill 286
Humidifying Picker Rooms 292
An Opinion on Rolling Cotton 292

KNITTING SECTION—
Hosiery Cost and Production Control System..... 295
The Behavior of Dyestuff Solutions 299
Manufacturing Full-Fashioned Hosiery Against Costs 305
The A B C of Dyeing 307
Machine Fixing and Fixers 313
To Prevent Back-Winding Silk 315
Preventing Long Loops on the Model K Machine.. 315
Experimental Work in Knitting Mills 316
To Avoid Cut-Outs on the B-5 316
Causes of Crepe Effect on Silk Hose 317
The Yarn Market 320
The Knit Goods Market 323
Among the Knitting Mills 333

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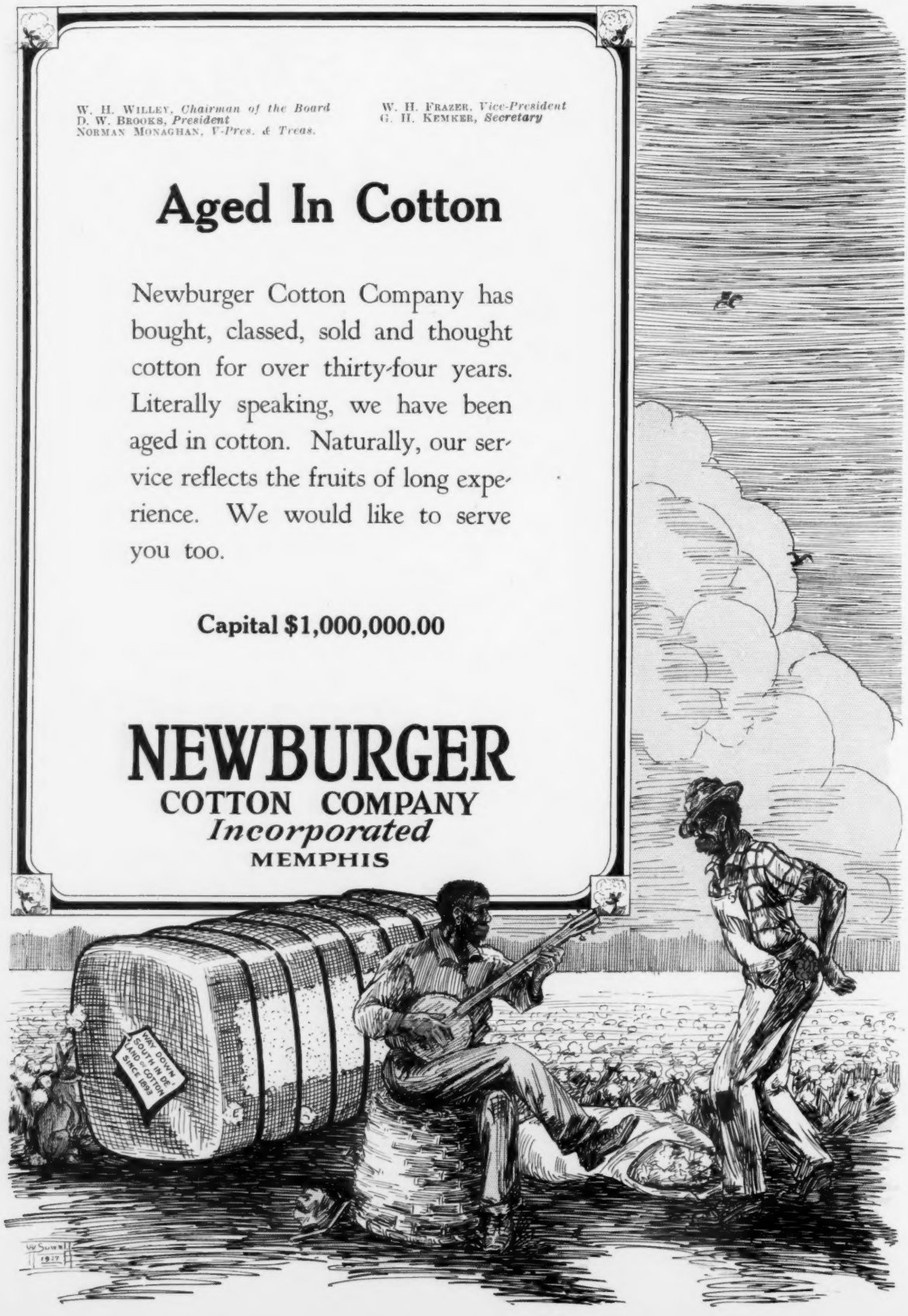


Opening and Cleaning Cotton

Modern Practices in England Discussed; Progress in America Illustrated by Descriptions of Recent Southern Installations

By J.H.Haddock

Erwin Cotton Mills Company, West Durham NC.

Several years ago it was the writer's privilege to visit a number of mills throughout the various parts of England and there was one outstanding advantage noticed in the lay-out of these mills as compared to ours. Great pains were being taken in opening and cleaning the raw cotton, and machinery manufacturers had developed equipment far superior to anything that we had seen in America.

Certain conditions with which we are all familiar had made it necessary that the English mills, in order to compete with those in other countries, use a lower grade of cotton than that used in foreign mills, and while doing this maintain that high standard of quality for which they have always been noted. In order to accomplish this feature, the mills demanded better cleaning machinery from the manufacturers, who in turn centered their efforts upon satisfying this demand, with the result that they have undoubtedly developed the most thorough machinery of its kind in use today.

English mills have a unit of opening and cleaning machinery for each breaker lapper; this unit usually consists of a willow, hopper bale breaker, hopper opener, automatic hopper feeder, lattice feed opener, Crighton opener, English cleaning trunk, and a combined exhaust opener and breaker lapper. The cleaning in this lay-out is obtained not so much by beating the stock, as by combing; this may easily be seen by following the cotton through the various machines.

The cotton is fed from bales onto the apron of a willowing machine; thence it passes into willow where a large amount of dirt and short staple is removed by the action of a spiked beater over grid bars. From the willow the stock passes into the hopper bale breaker, which opens it up by means of a coarse combing action as follows:

The cotton coming from the willow is carried forward by the horizontal apron and forced against the spikes of an inclined lifting apron, where it is subjected to a combing action and carried upward to a spiked roller which gives additional combing, and throws back into the hopper any large unopened bunches, thus obtaining a better opening and mixing of the cotton before it leaves the hopper. The spiked roller is stripped and kept clean by a stripping roll, the surplus cotton falling back into the hopper. The cotton after passing the spiked roller is stripped from the inclined apron and falls on a grid in the delivery sheet connected to the patent hopper opener, into which machine the cotton next passes.

The hopper opener is designed especially for opening cotton by means of the combing action of a very strongly spiked lifting apron and evener apron. The lifting apron is fitted with metal lags, to which each spike is riveted, which prevents breakage. The essential feature of this machine with its mechanical arrangement, is to automatically control the feeding of the cotton from the bale breaker to the hopper feeder. The hopper bale breaker feeds the hopper opener, which opener is provided with two weighted and balanced swing doors. It is these doors which automatically regulate the delivery of cotton. The value of the combing action by the use of spiked lattices is in the fact that the cotton is opened up without damage to the staple and without cutting the fiber. After being opened up, sand, seed, leaf, and other foreign matter, are free to drop out through the several grids, over which the stock passes on its way to the exhaust opener.

After leaving the hopper opener, the stock passes into the automatic hopper feeding machine, which further opens the cotton by the action of fine pins in the lifting and evening lattices. The lattice feed opener is the next machine into which the stock passes. This machine is equipped with an evener motion which controls the passage of the cotton through the unit, thus insuring an even delivery. After passing through the evener motion it enters the machine where it comes in contact with a 24-inch cylinder and grid bars; the grid bars extending about three-quarters the circumference of the cylinder, which is made possible by having the feed rolls and delivery trunk on the same side of the machine.

From this machine the cotton passes through conveyor pipe to the Crighton opener, thence through an English cleaning trunk, and to the picker room where it enters the exhaust opener lap machine.

The suction or drawing power for the cotton passing from the lattice opener, Crighton opener, cleaning trunk, and conveyor line, to the exhaust opener, is furnished by the exhaust cylinder of the opener lap machine. This cylinder in conjunction with the cage fan delivers the cotton onto the cages, from which it passes to feed rolls, and is cleaned by a beater, usually a three-blade; after which it passes from the cages to the calender roll and is formed into a lap. Approximately 790 pounds per hour is put through a unit of this kind and is considered a good production for the quality demanded.

It has been the attitude of American mills, more particularly up until more or less recently, to pay little attention to their opening equipment, and to spend just as little in this department as was absolutely necessary to get along with. A few of the more progressive concerns, however, have created a demand for improved opening and cleaning equipment, and our machinery manufacturers are today turning out machines which will give good results, and if fed at a reasonable rate, will no doubt do excellent cleaning. A mill cannot expect, however, to install in a plant consuming 100,000 pounds of cotton a week, one unit of cleaning machinery, no matter of what type or make, and obtain most satisfactory results. It is our opin-

ion that the English mills have gone further in the direction of limiting production than is necessary, but this was forced upon them by having their opening equipment hooked up direct to the breaker—the breaker being of less capacity than the unit of cleaning machinery. Our system of having the opening machinery deliver cotton by use of distributors into hoppers in the picker room, enables us to run our opening equipment up to capacity and over. We find very few plants, even with the most modern installations, that are not putting through by far too much stock, thus overworking their machinery and failing to obtain the results desired in the way of cleaning. Our tendency is to go just as far in the direction of extremely high production as our overseas neighbors have on the conservative side, and of the two evils ours is no doubt the most serious. Between the two lies a point of satisfaction and economy in opening and cleaning, and this point should be very carefully determined in the individual plant.

As stated before, due to a recently created demand, our machinery manufacturers are producing opening and cleaning machinery today that is far superior to anything heretofore used in America. We have tandem feeders,

TEST NO. 1.

Bale Breaker, 2 Vertical Openers, 1 Horizontal Cleaner. Pounds of Cotton Run, 5,537. Strict Middling Cotton.

	Speed R.P.M	Per Cent Waste
First Vertical Opener	775	1.273
Second Vertical Opener	587	.577
Horizontal Cleaner	450	.307
TOTAL WASTE		2.158

TEST NO. 2.

Bale Breaker, 3 Vertical Openers. Pounds of Cotton Run, 5,631. Strict Middling Cotton.

	Speed R.P.M	Per Cent Waste
First Vertical Opener	770	1.278
Second Vertical Opener	593	.772
Third Vertical Opener	471	.426
TOTAL WASTE		2.477

TEST NO. 3.

Bale Breaker, Vertical Opener, 2 Horizontal Cleaners. Pounds of Cotton Run, 5,840. Strict Middling Cotton.

	Per Cent Waste
Vertical Opener	1.044
First Horizontal Cleaner	.530
Second Horizontal Cleaner	.312
TOTAL WASTE	1.887

TEST NO. 4.

Bale Breaker, 3 Vertical Openers. Pounds of Cotton Run, 6,054. Strict Middling Cotton.

	Per Cent Waste
First Vertical Opener	1.073
Second Vertical Opener	.670
Third Vertical Opener	.404
TOTAL WASTE	2.147

TEST NO. 5.

Bale Breaker, 3 Vertical Openers, 1 Horizontal Cleaner.
11 Hours' Run, 15/16- to 1-inch Miss. Cotton.

	Per Cent Waste
First Vertical Opener	.787
Second Vertical Opener	.603
Third Vertical Opener	.579
Horizontal Cleaner	.201
TOTAL WASTE	2.170

TEST NO. 6.

Bale Breaker, 3 Vertical Openers, 1 Horizontal Cleaner.
4,670 pounds Cotton Run, 7/8- to 1-inch Strict to Good Middling Cotton.

	Per Cent Waste
First Vertical Opener	.642
Second Vertical Opener	.449
Third Vertical Opener	.310
Horizontal Cleaner	.139
TOTAL WASTE	1.540

TEST NO. 7.

Bale Breaker, 3 Vertical Openers, 1 Horizontal Cleaner.
Pounds of Cotton Run, 18,417. Low Middling Gray and Spotted ,one-half each.

	Per Cent Waste
First Vertical Opener	1.748
Second Vertical Opener	1.069
Third Vertical Opener	.888
Horizontal Cleaner	.409
TOTAL WASTE	4.114

TEST NO. 8.

Bale Breaker, 2 Vertical Openers. Pounds of Cotton Run, 110,291, Strict Middling.

	Per Cent Waste
First Vertical Opener	.890
Second Vertical Opener	.590
TOTAL WASTE	1.480

TEST NO. 9.

Bale Breaker, 3 Vertical Openers. Pounds of Cotton Run, 10,364. Strict Middling.

	Per Cent Waste
First Vertical Opener	1.010
Second Vertical Opener	.630
Third Vertical Opener	410
TOTAL WASTE	2.050

TEST NO. 10.

Bale Breaker, 2 Vertical Openers, 1 Horizontal Cleaner.
Pounds of Cotton Run, 14,128. Western Low Grade.

	Per Cent Waste
First Vertical Opener	2.590
Second Vertical Opener	1.670
Horizontal Cleaner	.651
TOTAL WASTE	4.911

TEST NO. 11.

Bale Breaker, Upstroke Cleaner, 2 Vertical Openers, Horizontal Cleaner.
Pounds of Cotton Run, 13,481. Western Low Grade.

	Per Cent Waste
Upstroke Cleaner	1.595
First Vertical Opener	1.854
Second Vertical Opener	1.209
Horizontal Cleaner	.801
TOTAL WASTE	5.459

TEST NO. 16.

Bale Breaker, 3 Vertical Openers, 1 Horizontal Cleaner. Pounds of Cotton, 4,706. 7/8 to 1" Strict to G. M.

	Per Cent Waste
First Vertical Opener	.658
Second Vertical Opener	.467
Third Vertical Opener	.318
Horizontal Cleaner	.116
TOTAL WASTE	1.559

TESTS 12, 13, 14 and 15.

Bale Breaker, 2 Vertical Openers, Horizontal Cleaner.

	First Vertical Opener Speed R.P.M.	First Vertical Opener Waste	Second Vertical Opener Speed R.P.M	Second Vertical Opener Waste	Horizontal Cleaner Speed R.P.M.	Horizontal Cleaner Waste	Fan Section Speed R.P.M.	Fan Section Waste	TOTAL WASTE
TEST No. 12 9,745 Pounds Western Low Grade	1008	2.913	787	2.098	559	.953	1350	.075	6.039
TEST No. 13 9,938 Pounds Western Low Grade Top, 3/4 inch.)	756	2.183	756	1.858	550	1.071	1350	.115	5.227
TEST No. 14 7,147 Pounds Western Low Grade	745	1.818	945	1.862	490	.611			4.292
TEST No. 15 7,918 Pounds Western Low Grade	745	2.017	745	1.646	490	.652			4.316

(Note: In Tests Nos. 14 and 15, Grid Bars set 3/4 ope n, Grid Bars set to Beater at Bottom, 1 inch. Grid Bars set to Beater at Top, ¾ inch.)

cylinder cleaners (some with cylinder running in one direction, and others running the reverse), vertical openers, horizontal cleaners, cleaning trunks, etc., all good machines. Therefore, instead of simply using a hopper feeder in the opening room, as in the past, many mills are installing units of machinery selected from those mentioned, the combinations varying with the individual opinion of the mill. We have seen a great many installations and various combinations, and run quite a few tests in an effort to determine which produces best results, and I give herewith the results of my findings, a close study of which will indicate the lay-out of those tested that was found most efficient, under the conditions.

These tests, while they are very interesting and show the comparative value as cleaners of these individual machines, are made on lay-outs, none of which in the writer's opinion is ideal.

I am firmly convinced that the proper way to open and clean cotton is by the most gentle treatment possible. In the opening, lumps should be combed out instead of being torn to pieces by main strength and awkwardness, as is done by rapidly revolving beaters, and present the stock to beaters for cleaning, in a well opened condition. They are then very much more effective as lumps of cotton do not exist in which motes, leaf, and other foreign particles, may hide.

If I were equipping an opening room today, the machines would consist of the following:

Bale breaker with extended feed apron, tandem feeder (one hopper having coarse spikes slightly finer than bale breaker, and one hopper with still finer spikes), horizontal cleaner, of a type containing a Buckley cylinder—one or two of these machines, depending on grade of cotton being run—and three or four sections of English cleaning trunk.

It is my opinion that this lay-out will equal or better any that we have seen and the results obtained in a manner that will cause a minimum of damage to the staple, thereby conserving strength for the yarns.

The cleaning trunk has not met with as widespread popularity in America as it has in England, and we attribute this fact to faulty installations. For instance, the cleaning trunk should never be placed near an elbow in the conveyor line, as it is dependent almost entirely upon the spiral motion of cotton as passing through the line for its cleaning, and elbows kill or modify this motion, thereby reducing the cleaning ability of such an installation.

While our machinery men are now devoting more attention to opening equipment than ever before, mills are trying harder than ever to determine which of the various machines and combinations of machines, produce best results, and are working hand in hand with the machinery builders, with the result that wonderful progress is being made, and we predict that in a comparatively short while, a mill without elaborate machinery in this department will be considered poorly equipped and in no position to compete with the more progressive ones. In fact we know of plants that are running today cotton two and three grades lower than before they put more modern machinery in their opening room, and at the same time producing just as good, and some think better, quality product. With such results as these being obtained, we cannot afford to ignore the question longer.

More scientific methods of opening and cleaning are with us to stay, our progress in producing satisfactory machines for this work will be rapid and the mill that fails to take advantage of them must suffer financially. A mill, however, must in my opinion choose the machines wisely. There are different ways of really cleaning cotton, some of which have a damaging effect upon the staple, and the others, although just as effective in cleaning, do it with no fiber damage. In this connection I will again state that cotton should be thoroughly opened before presented to beaters, (this being particularly true with some types of beaters, but important regardless of type), and there is no more gentle opening than that obtained by combing. Thoroughly opened cotton requires comparatively little beating to clean, and the less beating given it, the more of the fiber's original strength that is conserved.

Opening bins a few years ago were considered necessary, and ageing or conditioning of the stock before processing essential for best results. This, however, has been found a mistaken idea, and few mills follow this practice now. On a certain range of numbers, if using compressed cotton, I should certainly prefer the opening bin, as in this case the advantage would be very noticeable. Otherwise, however, we do not believe the difference in results justifies the additional cost.

Humidity should never be installed in an opening room. The drier the cotton the more readily foreign particles separate from it, and we believe some system whereby cotton could be thoroughly dried before putting through the cleaning processes would prove advantageous. There is no doubt but that the proper place for humidifiers is after the stock leaves the cards, and if used before ,it is to the disadvantage of obtaining proper results.

DESCRIPTIONS OF LAY-OUTS.

The most outstanding trend in textile practice within recent months has been the increased attention paid to better opening and cleaning cotton. Efforts of machinery builders and mill men alike have been concentrated upon this department in the mill, and remarkable developments have been made over previous practice in many instances. To review this trend adequately and to present illustrations of it is the special purpose of these pages.

The article ending on this page offers the observations and experiences of a man who has specialized in this phase of mill operation, with a vast amount of background and experience behind his expressions and recommendations on the subject. The tests shown on the opposite page are extensive and comprehensive.

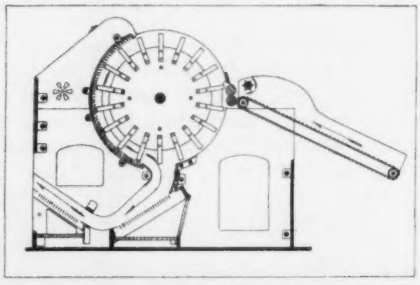
It is hoped to give a general idea of the varied types of cleaning equipment in use by presenting, in the following pages, detailed and illustrated descriptions of a number of recent southern installations of different kinds of cleaning equipment, to supplement Mr. Haddock's article discussing the general subject. It is felt that most of the major methods of cleaning of recent development are covered in this cross-section of southern mill practice.

Installation of Whitin Equipment at Pell City

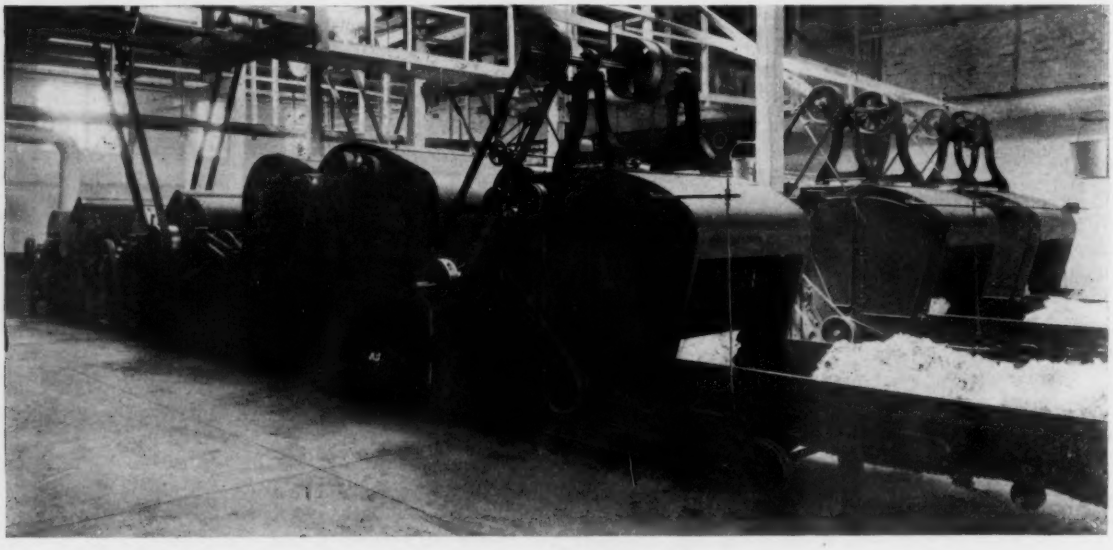
The Pell City Division of Avondale Mills, at Pell City, Ala., manufacturers of denims and other colored goods, have recently installed an interesting Whitin Machine Works equipment for opening and cleaning low-grade cotton. The elevation beneath the photograph of this installation will give an idea of the course of the cotton. From the bales, the cotton is given a preliminary opening by a heavy duty bale breaker, passing then to the tandem feeder. This consists of two automatic feeder hoppers, the first being equipped with a coarse spiked lifting apron, and the second with one of somewhat finer spikes. This graduated action is designed to present the cotton to the cleaner in a thoroughly opened condition, free of lumps. The three tumblings, also, it is stated, gives an additional mixing and blending.

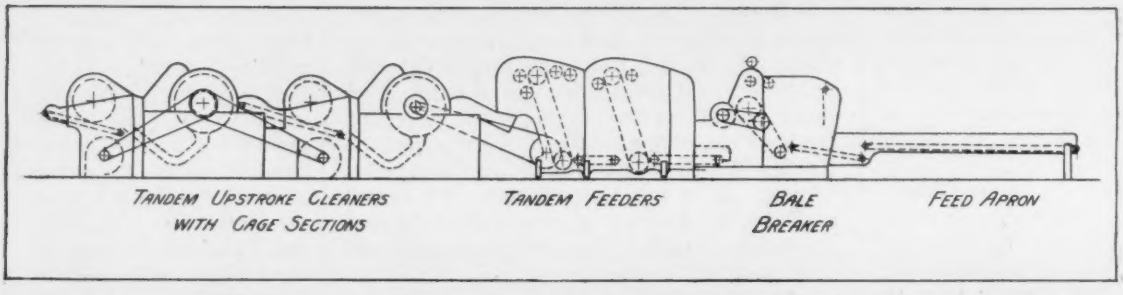
From the tandem feeder the cotton goes through the first Buckley cleaner. This machine is the heart of the system. A large, low speed beater, 41¼ inches in diameter, is used to take out the leaf and trash and avoid pulverizing this material and sending it through with the work. The cotton is delivered from the tandem feeder, onto an inclined apron to a pair of feed rolls, from where it is beaten in an upward direction by an up-stroke Buckley beater. In this action, the cotton is beaten from the feed rolls instead of being presented in loose form to the action of the beater. The principle of this method is explained by comparing it with holding a tuft of cotton in the fingers of one hand and cleaning it out with the other hand. While the beater travels in an upward direction, it is explained that this is no advantage in itself; however, with this method the cotton is discharged at the bottom of the circumference of the beater.

The beater has 288 fingers arranged in a way that every point on the feed rolls is combed twice in each revolution. These fingers beat the cotton against double-lipped grid bars which are set about its circumference. There are 65 of these grid bars, giving a cleaning area of over sixteen square feet. It is through these that the greater amount of leaf, motes and trash is ejected.



A detail showing the construction of the up-stroke cleaner.





A photograph and elevation of the Whitin system of opening and cleaning, designed around the up-stroke Buckley cleaner, used in tandem, as installed at the Avondale Mills Division at Pell City, Ala.

A detail view of the Buckley cleaner is shown in an accompanying sketch. It will be noticed that after passing over the grid bars, the cotton is discharged through an opening at the bottom of the cylinder, passing then over about nine square feet of cleaning bars for removing fly and fine dust. It is explained that the upstroke arrangement, allowing the cotton to be discharged at the bottom of the cylinder, permits the use of these bars.

Just behind the discharge opening will be noticed adjustable air bars, which are made like the strips in a Venetian blind. These can be opened or closed to vary the draft of air entering the cotton passage. When they are wide open, very little air is pulled from the cylinder; this design is for the purpose of allowing a maximum of waste to be taken out when a greater amount of short staple is desired to go through. The amount of air drawn through the cylinder can be increased, and the cleaning through the grid bars reduced by closing these air bars, thus giving a positive control of draft.

From this Buckley cleaner, the cotton goes through a cage section, which collects it and presents it to a second Buckley cleaner, similar to the first, from which it goes to another cage section. These cage sections serve two purposes: In the first place, they give a positive draft control through the cleaner, enabling the mill, by cutting down the fan speed, to pull the cotton through very slowly, for thorough cleaning; and, in the second place, a great deal of fine dust and fly is taken out of the cotton by the cage section fans and delivered to the dust room.

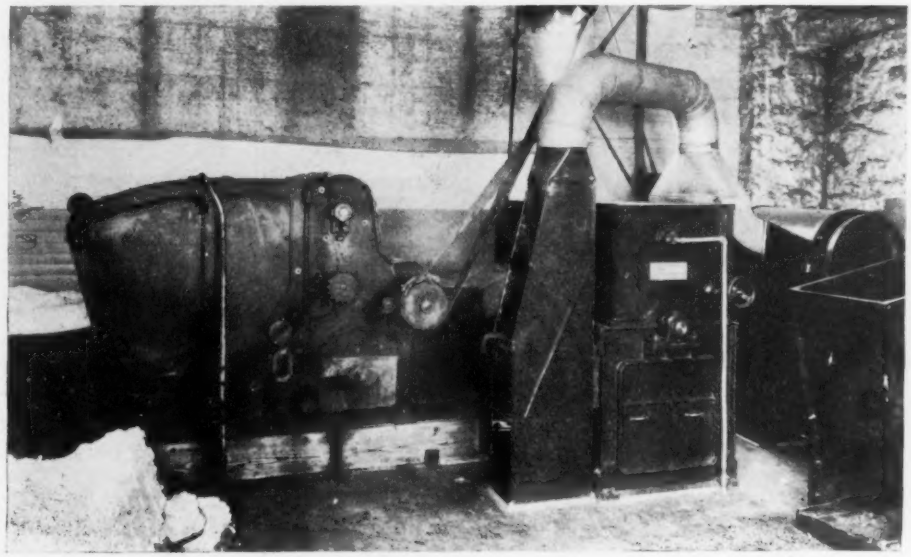
The installation at Pell City consists of three lines of this equipment. One line is used for filling, and from the second cage section in this line, the cotton is delivered directly into the mouthpiece of a conveyor pipe. The other two lines, for warp cotton, discharge onto a lattice feed table. Each line of pickers is individually and separately driven by electric motor. From the opening room the cotton goes into an automatic distributor of the new Pelzer type, on the back of the breaker pickers, passing through sections of English cleaning trunk located in the conveyor pipe.

Milstead Mfg. Co. Has Centrif-Air Unit

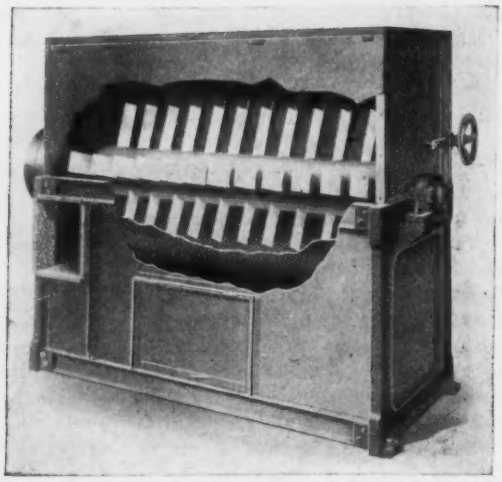
One of the Callaway group of mills, Milstead Manufacturing Company, Milstead, Ga., has an installation of the Centrif-Air adjustable cotton cleaning system, which has been selected as the illustration for this type of equipment. The large photograph shows the system as installed at the Milstead mill, in conjunction with an H. & B. bale breaker and cage section delivery.

The complete cleaning system is remarkably small, occupying approximately 3x7 feet floor space, and requires from two to five horse-power, dependent upon the quantity and condition of the cotton. The operating range of the beater is from 300 to 400 r.p.m. The cleaner proper operates without an air current pulling through it to assist the passage of the cotton. This design was effected to eliminate anything to counteract the centrifugal effect of the work arms of the beater, or pull light leaf particles along with the cotton. A detail showing the interior of the cleaner is given in the small illustration. The cotton is carried through the cleaner by being thrown against and sliding down a series of pivoted bronze cleaning control vanes in one side of the cleaner top, as shown. These vanes are adjusted by means of a control arm and handwheel. As the handwheel is turned to the left or the right, it increases or decreases the pitch of the vanes, either speeding up the passage of the cotton through the cleaner, or slowing it down, as desired. The Milstead equipment does not contain a fan under the cleaner screen, but other installations have this for drawing downward through the screen perforations very light dust and finely pulverized leaf particles.

As the cotton comes to the cleaner from the bale breaker, the work arms, which are of bronze for preventing sparks and fires, throw it upward into the high top of the cleaner at each quarter turn of the cylinder. As it passes into the



At Milstead the cotton passes through the bale breaker to the Centrif-Air machine, as shown. Note the handle wheel control for the vanes in this machine. The cotton is delivered from this cleaner to the H. & B. cage section delivery.



A sectional view of the Centrif-Air machine. The beater blades are of bronze.

high top, the tendency is to expand and bloom naturally, and slow down in its forward travel. This principle, it is explained, prevents a tendency to roll and curl; also leaf, etc., is loosened in the expanding and blooming action. When the cotton is slowed down in its forward travel, it is subjected to a continuous whipping action as long as it is in the cleaner. The cotton thus cannot get up to the same speed as the beater, and be scoured on the screen.

The opened cotton and hard waste materials are discharged from the bottom level of the cleaner screen, into a vertical adjustable separator. The centrifugal force set up in the cleaner causes all hard materials heavier than the cotton to be discharged below the cotton and at a faster speed than that of the cotton. A baffle in the separator is adjustable so that the air coming up through the open bottom of the separator will lift the light, slow-traveling cotton upward through the separator to the trunk line, allowing the harder materials to strike the back of the baffle plate and be deflected downward to the bottom of the separator.

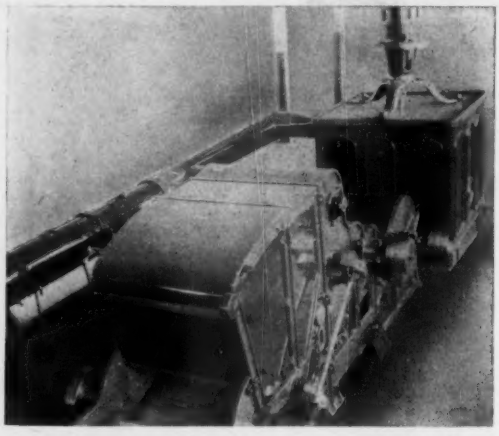
Gray iron is used for the end frames of the cleaner, the side frames are of channel iron, and the top and perforated cleaning screen are made of ⅛-inch steel. The main beater shaft is carried on S.K.F. self-aligning ball bearings. The beaters are made of bronze for fire protection and the arms are ⅛-inch thick on the working surface, four inches in width, and streamlined to prevent eddy. currents in the cleaner. It is stated that in passing along on the four-inch sides of the work arms, the cotton actually has a tendency to straighten out instead of to curl.

An H. & B. Installation for Wide Cotton Range

A typical installation recently made by the H. & B. American Machine Company, Pawtucket, R. I., for handling a wide range of cottons, consists of a hopper bale opener fitted with 24 feet of low extended feed lattice and automatic feed regulator. This machine delivers directly into a special type of hopper feeder with pin combing cylinders and directly connected to a small cylinder opener fitted with a serrated feed roll and weighted cotton holders. This opener has an extensive grid bar area and is fitted with connections either for delivery to a single Crighton opener or to by-pass the opener, according to the class of cotton. From the Crighton the cotton is carried through a pipe and over six 4-foot sections of English cleaning trunking upstairs to a condenser, which is located on the second story of the building. This delivers the cotton onto an automatic distributor which deposits it into four separate bins. As a wide range of cotton is used in this mill, the selective system was adopted for controlling the bin supply. Electrical attachments for suitably controlling the supply of cotton are used.

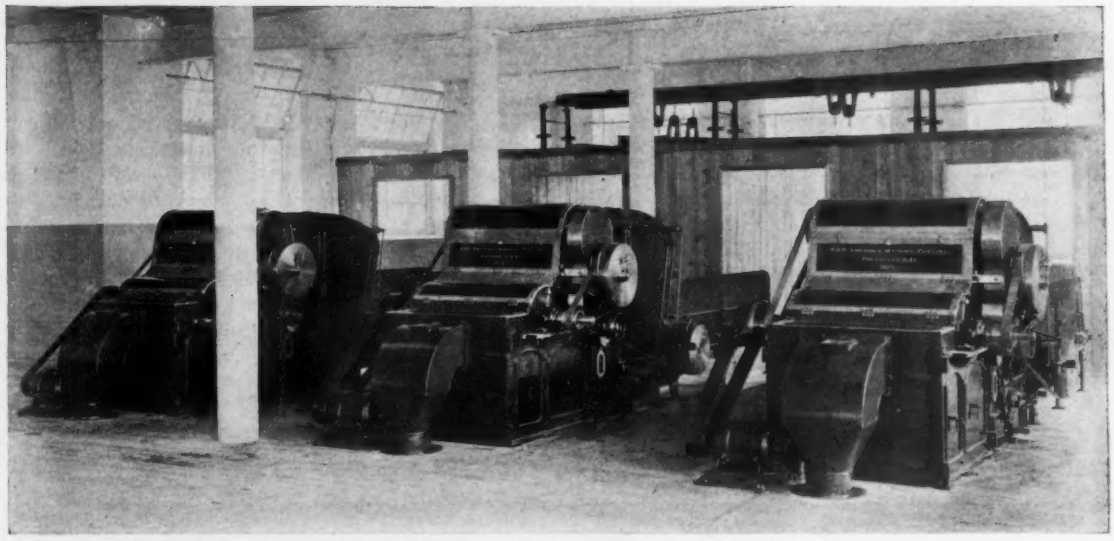
For the secondary process, three hopper feeders with pin combing cylinders and extended feed lattices with automatic feed regulators are located on the second floor, directly in front of the opening bins. Each of these machines is driven with individual motor. They deliver directly through piping to patent cage exhausters mounted on the superstructure of the automatic feeders located on the floor below. Each machine is fitted with a magnetic switch for governing the supply of cotton delivered to the feeders on the second floor.

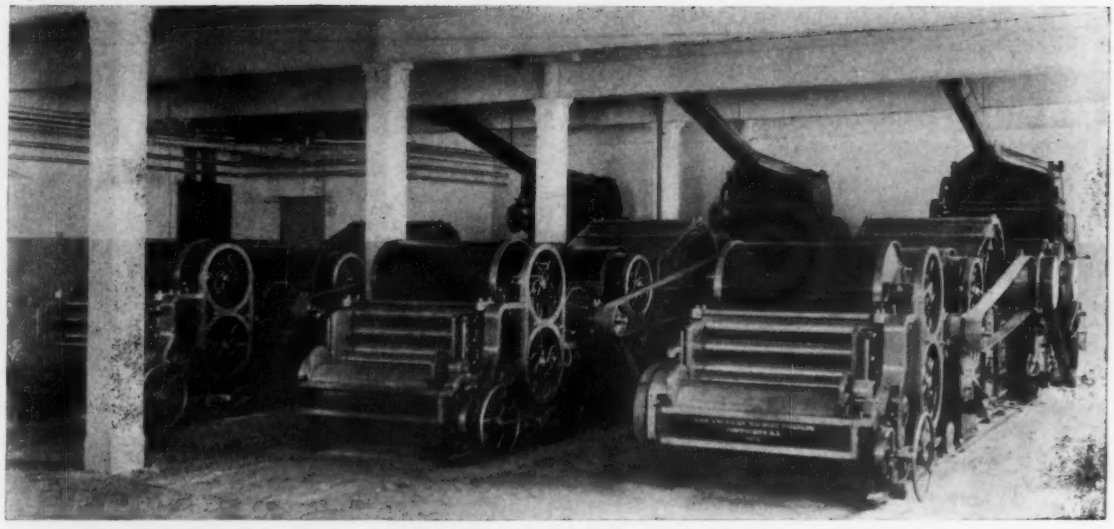
The cotton from the cage exhausters is delivered directly into the bins of the automatic feeders which are each connected to combination single Buckley openers and breaker lappers. These machines are equipped with piano pedal link regulators for insuring a uniform supply of cotton. A notable feature of this combination machine is the driving of the spiked apron in the automatic feeders from the evener top cone of the Buckley regulators, for the synchronization of the entire equipment. This is the only unit being described in this section which delivers a lap from the opening machinery. This combination Buckley opener breaker lapper also gives what is termed the full width feed, that is, after the cotton is deposited in the hopper of the feeder it is carried forward continuously in a sheet the full width of the machine.



The hopper opener and Crighton showing pipe into which cotton is by-passed ahead of Crighton if desired.

The installation for the formation of the finished laps consists of five finisher lappers fitted with piano link regu-





The cotton is discharged into the opening bins on the second floor, shown in top photograph, from first cleaning equipment downstairs, shown on opposite page. It is run then through the hopper feeders directly in front of the bins, carried through floor to machines in lower photograph, located on the first floor, which deliver breaker laps.

lators and consolidated calender roll delivery.

The complete lay-out was planned to secure as much opening as possible without injury to the fibers and as much cleaning as possible without curling or stringing them; particular stress being laid upon the reduction of the blade beater to suit the particular kinds and grades of cotton being worked.

It will be noted that a by-pass connection is arranged between the cylinder opener and the Crighton opener, the reason for this being that when working staple cottons, it is stated that the cleaning is obtained by the cotton being severely beaten in its passage up the conical beater, and on this account there is a liability of the material not being equally dealt with in this installation. The by-pass accordingly provides for the cotton being taken directly from the cylinder opener to the condenser upstairs without passing through the Crighton.

In the Buckley opener used in this installation, a series of segment plates are arranged above the feed roll and carried about one-third of the way around the cylinder, and spikes or projections on the inside of these plates serve to detach the cotton from the cylinder and provide an additional opening action. By using more than one cylinder, it is pointed out, it is possible to clean low grades on the Buckley principle with a minimum of beating. In the operation of the Buckley opener, the cotton is carried away in small tufts from the feed roll, without passing immediately over grid bars, being retained in a given space, so that it is not influenced by direct air currents.

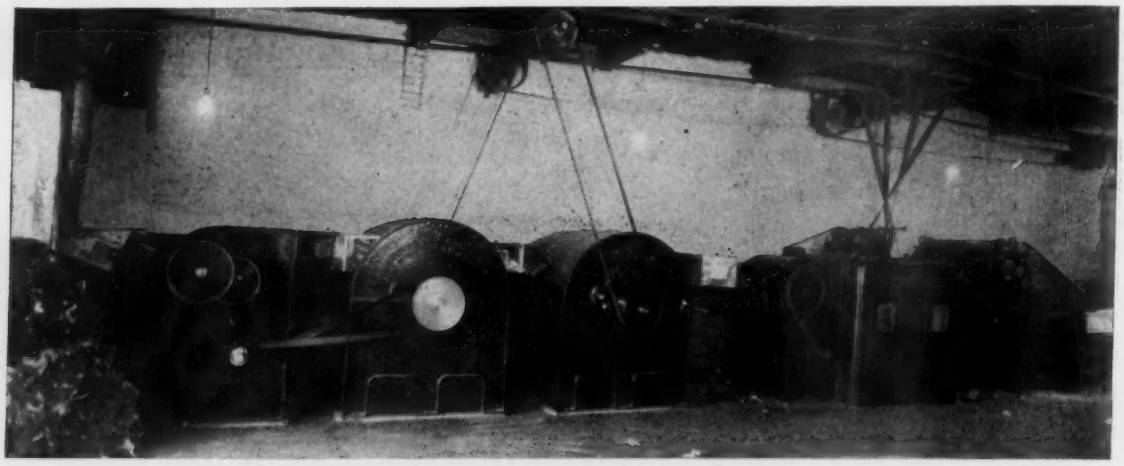
This machine, it will be noticed, is installed for handling cotton which has been opened by preparatory equipment, and is fitted with the maximum number of grid bars. However, it is pointed out, that even with this extensive gridded surface, no attempt is made to secure cleaning in the upward path of the cylinder.

The intermediate process of lapping is dispensed with because of the preliminary cleaning, the cotton going to the finishers from the breaker.

The "Whirlwind" System—by Woonsocket

It has been a serious problem for many years to devise means by which baled cotton could be brought to an ideal condition for carding. Properly opened and cleaned cotton fed to the pickers is of inestimable value in maintaining the proper condition of all working surfaces in subsequent processes, such as beater blades, licker-in wire, card clothing and roll surfaces. Opening, airing and cleaning cotton is recognized as essential, to remove from the picker as a chief function everything except the production of laps.

The "Whirlwind" opening, cleaning and aerifying unit, which is shown in the accompanying illustration as installed in a prominent southern mill, has been developed by the Woonsocket Machine & Press Co., Inc. In actual operation, this line handles approximately 10,000 pounds per day, although a larger production is entirely feasible.



The Woonsocket "Whirlwind" cotton opening, cleaning and aerifying unit, consisting of bale breaker, vertical opener, condenser section and two horizontal cleaners in tandem, with final condenser section.

The first machine in this unit is the high duty bale breaker. This is equipped with enclosed dirt proof ball bearings throughout, and has a hand wheel adjustment to control the degree of opening and production. A single belt drive is used, with stretch take-up for regulating the relative speeds between the apron, strippers and doffer. A normal driving pulley speed is obtained by means of an enclosed gear reduction unit between the main pulley and apron drive. A patented delivery outlet with air control adjustment is provided to remove from the cotton any metallic or heavy material. The 12-foot extended start and stop apron is automatically operated.

Next the cotton goes to the vertical opener. The beater in this machine is cone shaped with beater blades placed in a spiral and bent at a slight angle for feeding the cotton as it revolves; also, it is pointed out, the cone-shaped beater causes the cotton to expand as the tufts and bunches are opened. The area is enclosed in a perforated metal case, allowing the dirt and fine lint to be thrown through the perforations by the centrifugal force of the beater. The opener is equipped with ball bearings throughout, provided with grease packed housings, which are lubricated by means of grease cups located on the outside of the frame. The beater is driven through spiral gears from a self-contained counter shaft, using an ordinary straight belt drive. The air that is drawn in with the cotton, it is explained, absorbs the excess dampness and dust from the cotton on its passage from the bottom to the top of the machine. This is primarily an opening machine.

From here, the cotton is discharged into a condenser section attached at the discharge opening, for separating the damp, dusty air from the cotton, and passing it through a self-contained fan to the dust room. In the opinion of many, the condenser section feature is not fully appreciated in opening equipment. Thus, an outline of its functions in opening and aerifying cotton may be of interest. First, it is pointed out, the speed of this self-contained, ball bearing fan serves to regulate the draft of air through the previous machines to which it is attached. As soon as the cotton reaches the condenser cage, the fine lint and impure air is separated from the cotton and passed to the dust room. Further, a supply of fresh air is introduced to pass along with the cotton. Also, the stripper roll to a certain extent condenses the cotton, putting it in this form for the next operation of opening and cleaning.

Reverting back to the unit being described, as the cotton passes on to the next machine, the horizontal cleaner, it takes with it a supply of fresh air that is of the same humidity as that in the room, having been drawn from the room at the condenser. The cotton enters the machine and passes horizontally while being rotated to the discharge at the opposite end. This machine has a large cleaning area of perforated sheet metal, almost surrounding a large upstroke centrifugal beater. The blades of the beater are arranged to operate on the cotton in a rotary, vibratory, horizontal and centrifugal action; the purpose of which is to reduce the tufts of cotton to a smaller size and allow the air to mingle and expand it to a fluffy condition. Centrifugal force takes place as the cotton is shaken and thrown against the perforated screen, so that dirt, leaf and fine lint will pass through the perforations. No feed rolls or grid bars are used in this machine.

The beater is the only moving part in this machine. It is 40 inches in diameter and 52 inches long, and is supported by ball bearings provided with grease-packed housings at either end.

The next process consists of another horizontal cleaner, similar in all respects to the previous one. The idea being to give a graduated treatment, the tufts becoming smaller and smaller, with more fine dirt and trash being removed. The final unit in the equipment is another condenser section, designed to further separate the fine dirt and dusty air from the cotton. As the cotton drops from this condenser section it enters a pipe line, again taking up a supply of fresh air. In this mill, the pipe line conveys the cotton to the main mill building where the pickers are located.

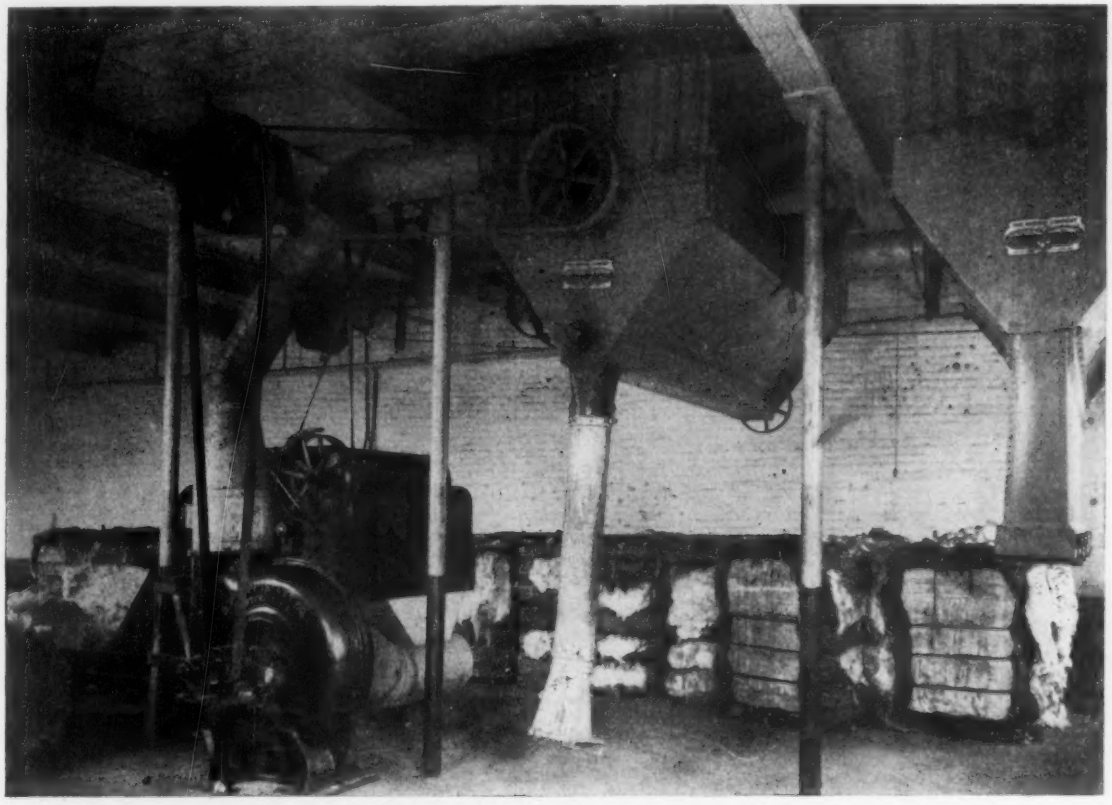
A Murray Application at Lowell, N. C.

The Lowell Cotton Mills, Lowell, N. C., were confronted with an interesting situation in solving their opening and cleaning problem. The company operates Mill No. 1 and Mill No. 2, both of which are located across the highway from the cotton warehouse. No. 1 Mill has 9,600 spindles and makes 40s to 60s yarn, while No. 2 mill, making 70s to 80s, has 14,300; the difference in the counts making both mills use about the same poundage of cotton. Both are combed yarn mills.

A view of the equipment installed to meet their needs is shown in the accompanying photograph. The opening and cleaning line consists of one H. & B. bale breaker, and two Murray cotton cleaning and aerating machines in tandem, located in the warehouse. A No. 6 bronze bladed fan is connected in the pipe line between the bale breaker and the first Murray cleaner, and the cotton passes through this fan into the first cleaner and through it into the second cleaner and is discharged into a conveyor pipe leading to the picker rooms of Mills Nos. 1 and 2. An interesting arrangement is that the two lines going into the separate picker rooms are connected above the roof of the opening room by means of a "Y" valve.

It is also interesting to note the location of the fan between the bale breaker and the first cleaner, which results in the cotton being blown through the cleaning equipment. No condensers are used, so that the cotton is blown into ageing rooms adjacent to the pickers in either mill.

The speed of the first cleaner is about 625 r.p.m., and the second about 650 r.p.m. The reason given for the greater speed on the second machine is to give a slight lead to prevent retarding of the air current. This provision is more important where a blowing system is used



The Lowell Cotton Mills feed two separate mills with this equipment, consisting of an H. & B. bale breaker and two Murray cleaners in tandem. Notice that the fan is located ahead of the cleaners, blowing the cotton through these machines, no condenser being used in the picker room. A single pipe line leaving the opening room supplies either mill, as desired, by means of a "Y" valve above the roof.

instead of the usual suction and condenser arrangement. The rotating reel in the cleaner generates an air current in proportion to the speed. It is stated that at 600 r.p.m., the current generated is sufficient to pass the cotton through the machine without the assistance of a fan when not connected in a conveyor line.

Briefly, the Murray cleaner consists essentially of a series of arms arranged spirally around a central shaft revolving in a perforated metal cylinder enclosed in an air tight steel casing. A screw conveyor at the bottom of the casing removes the waste and discharges it into a convenient receptacle. It is installed in the conveyor pipe between the bale breakers and the picker room. In the Lowell installation no change in the conveying system was necessary when the tandem machines were installed in the pipe line. At this plant, the first machine is equipped with a 6-inch dirt conveyor discharging into an 8-inch pipe that is fitted with a gravity operated discharge valve that operates automatically. The second machine has no conveyor, but instead a waste hopper the full length of the reel; this hopper being sufficient to collect the waste from a day's run, and being equipped with clean-out doors for removal of the waste when the machine is idle. The Murray machine, forming the basis of this lay-out, is manufactured by The Murray Company, Atlanta, Ga.

Georgia-Kincaid's Saco-Lowell Lay-Out

In the early days of the textile industry in this country, very little, if any, cleaning machinery was used other than the standard picker equipment, with extremely high beater speeds, to open as well as clean.

The southern planter required of the help picking the staple from the plant that they manipulate their hands among the leaves so as to get the staple only from the boll without including any of the leaf, boll or stem holding the boll on the stalk.

The scarcity of labor has been one of the factors counting for the laxity in requirements which insure the picking of the cotton to insure less trash.

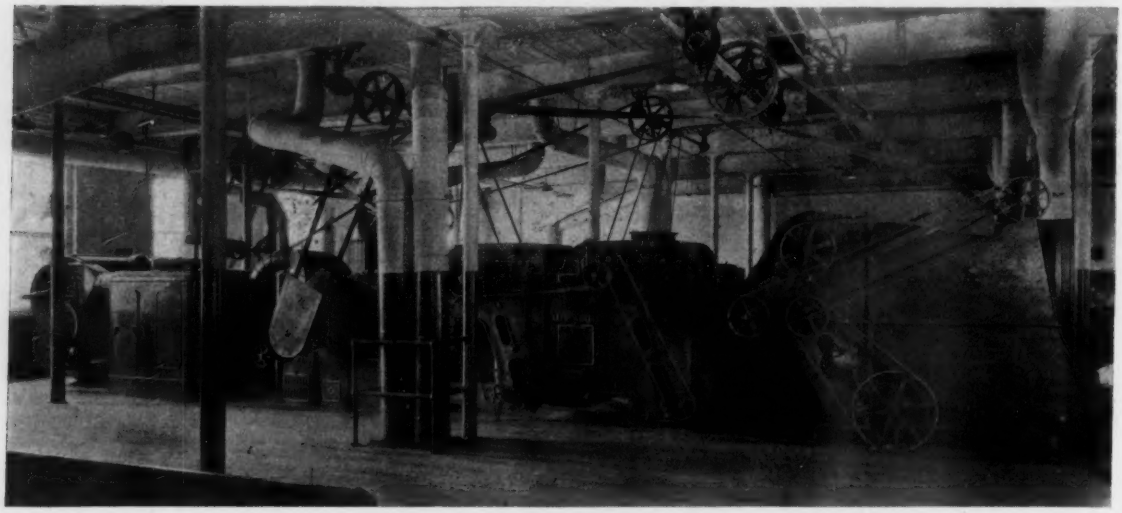
The differences in prices of the lower and higher grades has been the main factor in urging or influencing the mills, in cooperation with the machinery builders, to develop opening and cleaning machinery to precede the pickers which would be more effective in performing this function in mill operation.

It might also be mentioned that the practice of blending has been in common usage for many years, and the high cost of opening by hand in order to spread out in ageing and blending bins has contributed a great deal toward the developing of opening machinery.

The accompanying illustrations show views of a recent installation similar to one made in one of the plants of the Georgia-Kincaid Mills, at Griffin, Ga., which company operates a number of mills producing towels, diaper cloth, and other products. This equipment is of Saco-Lowell make, produced in the company's Kitson plant, which is entirely devoted to picking and opening machinery, where the engineers developed a line of equipment designed so that each machine therein performs a certain function in opening or removing a certain class of foreign matter.

In the Georgia-Kincaid lay-out, the first machine in the line is the Model No. 4 bale breaker, which has been on the market for a number of years. It was designed to handle bales compressed under the high density system as well as the standard gin-baled cotton. The hopper of the bale breaker measures 36 inches inside; a short thick slat is used in the lifting apron with a view to reducing the amount of vibration. The length and depth of the hopper were also designed to give the same cubic contents as a wider hopper with the use of narrow aprons, short apron shafts, etc. The breaker is equipped with an automatic feed regulator and extended feed apron with start and stop control for insuring a constant level of stock in the hopper.

In this line, there is one other machine used, following the bale breaker and prior to the beginning of the actual cleaning operations. This is known as the tandem opener



An installation of Saco-Lowell opening and cleaning equipment similar to that at Georgia-Kincaid Mills.

feeder, Style No. 6, the purpose of which is to receive the cotton from the bale breaker and deliver it to the next machine, which is the first cleaning unit in the line. This is equipped with pin lifting aprons with finer pins or spikes than those used in the bale breaker, and in it either a pin stripping roll or stripping comb with oscillating motion is used. In addition to the opening feature, some small amount of cleaning is done by the tandem feeder.

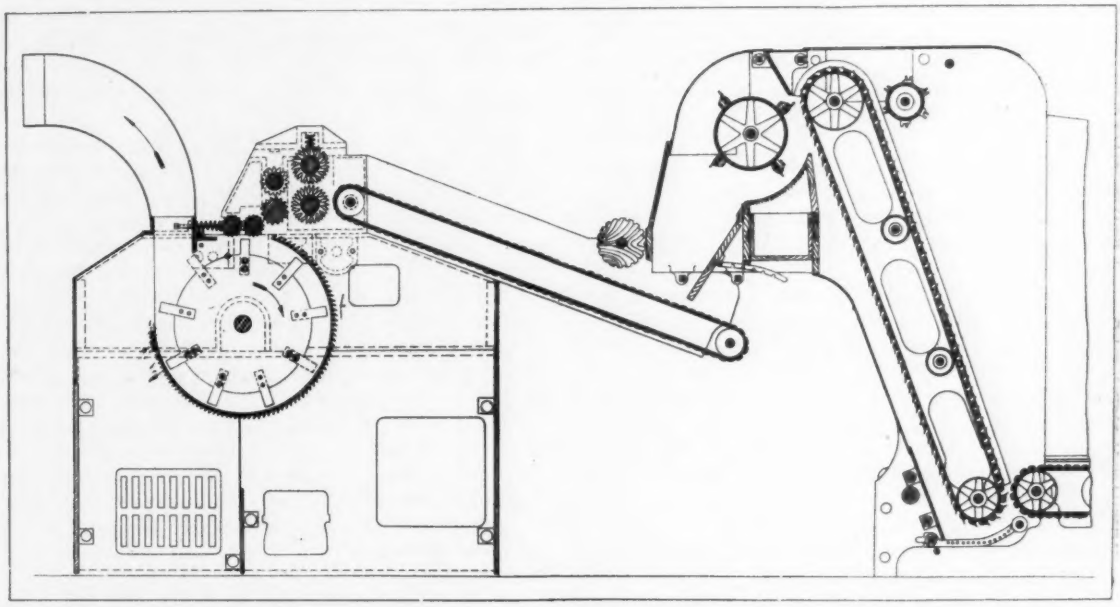
When the cotton has been well opened by the preceding machines it is ready for cleaning, and for this purpose, the Saco-Lowell patented lattice opener and cleaner, Model No. 12, is used. This is designed to remove mostly heavy motes, as well as some leaf and sand. In order to take advantage of the greatest amount of possible grid surface or space in the circumference of the cylinder or beater, this machine is fed by an inclined lattice apron delivering through a series of feed rolls to the beater at a point directly over the beater and in the same vertical plane with the shaft. In explanation of this method, it is pointed out that to obtain the greatest efficiency, the stock must be fed evenly and continuously, and to feed evenly from a bale breaker or feeder the apron receiving the stock moves at a speed which will permit a reasonably heavy bat to collect on the apron. With the view that to clean well over grids with a beater, the stock should be fed in a thin even sheet, with the production being governed by the rate of speed through the machines, three pairs of feed rolls, constructed so as to avoid lapping, are used in feeding this machine.

The beater in this machine is of the Buckley type, and is 24 inches in diameter, with an extra amount of picks. It is explained that this size beater is used because the angle at which the stock when struck against the grids rebounds into the beater for another strike is more acute than it would be with a larger diameter; furthermore, that the air drafts assisting or retarding the operation of cleaning with grid bars is under better control.

Around three-quarters of the circumference of this beater are 80 patented adjustable grid bars, adjustable in sets of ten each. A baffle plate is used under the grids, to the floor, in the vertical plane of the beater shaft, to do away with air drafts that would cause disturbances. The outlet is at a tangent to the circumference of the cylinder for overcoming choking.

The lattice openers are arranged in tandem.

Following the Buckley cleaner at Griffin comes the vertical opener, which is equipped with the patented adjustable grid bars, and was installed to remove a lot of leaf and sand as well as motes, the chief object, however, being to remove the short fly. This vertical is also equipped with the screen section apron delivery, in which is a suction fan. The vertical opener and screen section are equipped with ball bearings throughout, being driven by the Gallows drive with a tension pulley.



This shows the No. 12 lattice opener, as it receives the cottom from the tandem opener feeder. The 80 grid bars around the three-fourths of the beater circumference are adjustable in sets of ten each, by means of cheeks, not shown in the drawing. Note that the cotton is fed directly over the beater.

The final cleaning unit in this installation is the horizontal cleaner, which is used for the removal of fine leaf. It consists of a spiked beater, consisting of round pipe flattened on the ends, a revolving mesh screen, etc. The screen revolves in order to prevent the waste which falls out above the horizontal plane of the beater shaft from falling back into the stock and from collecting between the screen and the sides of the machine, taking it to the bottom where it is conveyed away by an apron clean-out. The beater shaft is ball-bearing. The beater spikes are arranged spirally giving them a tendency to convey the cotton from the inlet at one end of the cylindrical screen to the outlet.

The stock is conveyed from the horizontal cleaner, by an exhaust fan and cotton condenser, to an automatic distributor over the hoppers attached to the breaker lappers.

In addition to the particular lay-out which has just been described, the Georgia-Kincaid Mills operate several other plants at Griffin, and have in some of them duplicate or similar lay-outs of opening and cleaning machinery.

Wages

BY LUTHER H. HODGES AND HARRIET L. HERRING.

The article below is one of a series which has to do with the fundamentals of business, or, more properly known as Industrial Economics. These articles are being published from month to month. Each one is a unit in itself, although forming an integral part of the entire series.

Practical mill men like practical material and these articles are designed to meet the needs of textile operating executives who are interested in knowing more about the laws governing business and industry. The entire series has already been used by a large cotton mill organization in the South in its educational work, and this organization found the material to be very practical and effective.

Each article lends itself to discussion by groups of mill men, as well as being helpful and interesting reading. Naturally the articles are brief and in attempting to cover this large field, only the most important points have been considered.

"Wages, as the term is used in economics, include all earnings assigned to men for their work, from lowest piece work wages to highest annual salaries and wages of management. From the point of view of production, wages are items in the normal expense involved in producing and putting goods on the market. From that of distribution, they constitute one of its great shares, into which a community's income of goods is divided." (Seager.) The others are interest, rent and profits. In fact, wages make up for the larger share of the national income. The National Bureau of Economic Research finds that in the United States the proportion has varied from 68.7 per cent for wages and salaries and 31.3 per cent for profits and interest in 1909 to 77.3 per cent and 22.7 per cent respectively in 1918.

Factors Which Modify Wages.

Time and piece wages, or some variation or modification of these two, are the main methods of paying for labor. When the work is uniform or the output can be easily measured, the employer prefers to pay a fixed price per piece. Then the worker "drives" himself instead of the employer doing so. With part of the money saved in foremen's wages, he can pay inspectors to examine the piece work. When the work is too varied for a piece work system, he pays the worker according to the time he takes on the work and employs foremen to see that he does not waste his time.

Under simpler economic conditions labor was paid for "in kind," that is, in the form of part of the actual products of the worker or certain living expenses. As money became more plentiful it gradually replaced payments in kind, fortunately before the day of specialization had gone very far, or the worker would have been in a most perilous condition. As examples of this were the employees of an East India Company in the 17th century in London who were on one occasion, paid off in pepper! The only relics we still have of this form of payment is the case of domestic servants who are given board and often lodging as part of their wage; agricultural workers, who get a house and garden at low or no rent; and tenants who share the actual products half and half or some other proportion.

"The weekly wage, however calculated, is very far from giving the true economic position of the worker; not the wage-rate, but the income actually received, determines his position. Hence, the regularity or irregularity of work is a most important consideration in comparing the advantages of occupations. Many casual workers are paid at a good rate while they are working, but their opportunities for work are so intermittent that their average weekly earnings are low and their economic condition correspondingly bad. . . . . In seasonal trades (including all trades affected by weather or fashion) the earnings of nine months may have to keep the worker during twelve months. . . . . In case of trades subject to considerable cyclical fluctuations, such as the ship-building trade, the average weekly wage has to be calculated over an even longer period. A man may work overtime for 18 months and then be on short time or without work for another 18 months; his true money wage is his average weekly earnings over the whole period." (Clay).

This same idea of averaging his earnings should, perhaps, be extended over his entire lifetime, or over the length of time he should live. If the conditions of his trade or profession are such that he is worn out too early, "old at forty," the wage must be proportionately higher to take care of this fact of shorter earning period. The steel industry has been such a trade until recently, and perhaps many traces remain where long hours, heavy work, exposure to dust, heat, double shift, etc., wear out the worker prematurely. Some observers claim that modern business is so complicated and such a strain on men's powers that it wears out the man in more important positions faster than formerly. Certainly we see today the responsible heads of many businesses are remarkably young men —the older ones have retired. Allowance must be made in dangerous or unhealthful trades for periods of illness. All these items may make a low wage out of one that sounds high.

The wages of the head of the family may be modified by what other members earn. The fact that one trade or one locality may furnish work for several, prevents a man from going where he himself might earn more, but they would have no employment.

The most important factor which may modify wages is the relation to the cost of living. The amount of goods and services that a given amount of money will purchase varies from time to time and from place to place. Wages now sound princely in comparison with what they were 20 years ago, but probably will not purchase much more. Wages in New England textile centers are frequently compared with those of the South, but when we consider higher rent, clothing, fuel and food, it is doubtful if there is a great difference. Wages tend to lag behind prices, both on the rise and the fall, so that the worker loses when prices are rising and gains when prices are falling.

Other factors which modify wages are "elements that can be subjected to no money measure: social standing, opportunities of promotion, risk, independence, health—all these, as well as wages, make differences as in occupations and may serve to raise or lower the wage in it." (Clay). As the economist, Marshall, says: "The attractiveness of a trade depends not on its money earnings but on its "Net Advantages."

Wages and Labor Cost.

Labor cost and wages are constantly identified and much arguing is done around this point that does not consider all the facts. Protective tariff is defended on the ground that it keeps prices up and high prices are needed to pay high wages. Labor leaders are told that higher

wages will not benefit the workers because they will mean higher prices. The fallacy lies in the point that the employer buys labor, not the laborer; if he can buy a great deal of labor from one man, it may pay him as well as, and probably will pay him better, than buying a little labor from each of two or three men. High wages, if the amount or quality of labor given in return for them corresponds, means "cheap labor," (Clay) and vice versa. Before the war, laborers for railroad building could be had in India at 9 to 12 cents a day; in England for 75 to 95 cents and yet it cost about the same to build a mile of road in both places. The manager of a textile mill in North Carolina was very much chagrined to find that, though his wage scale was lower than that of a neighboring company, his labor cost per unit of goods was higher.

Although the conflict between employer and employee is generally considered to center around wages, there are many grounds for a meeting of the two even on this difficult point. Wages can rise without hurting the employer so long as he pays higher wages only to workers who give an equivalent output of work. By organization, or by use of machinery, he can reduce his labor costs without harming the workers, if the improvement enables the worker to give a larger output. If increased wages will stimulate more output, it may result in even lower labor cost to the employer. Perhaps no point of economic law is more popularly misunderstood or causes more bad feeling, than this one by both employer and employee, and none has more far-reaching personal effects.

Wage Theories.

One of the great reasons for misunderstandings about wages is the relics of old wage theories that are in the minds of all of us, even if we don't recognize them by that name.

The subsistence theory or the iron law of wages was stated about 1817 by Ricardo, who based it upon his observation that the peasants of France had barely enough to exist on.

"Labor, like all other things which are purchased and sold and which may be increased or diminished in quantity, has its natural and its market price. The natural price is that price which is necessary to enable the laborers, one with another, to live and to perpetuate their race without either increase or diminuation." The market price is what is really paid for it. When, for a combination of reasons, imports, improvements in agriculture, etc., the market price exceeds the natural price, the worker is flourishing and raises a large family. The labor market is then oversupplied and the market price falls below the natural price and poverty reduces the numbers so that wages will rise and so on." (Ricardo).

Today the theory finds a survival in the belief that competition for work is so great that any subsidy to the laborer from the state or charity will merely induce him to accept a lower wage, leaving his condition as it was. It is doubtful if, the world over, the majority of workers have now or have ever had a subsistence income according to Ricardo's theory. In countries and among classes of workers who do have it nowadays, the law is modified by standards of living, the birth rate falls as the wages and standard of living rises.

According to the wage fund theory there is for any country, at any time, a sum of wealth, part of capital, set apart for the payment of wages . . . it may vary from time to time (as capital and workers vary) but at any given time it is definite and cannot be increased by law, public opinion, sympathy of employers or efforts of the workers. The sum is distributed by competition and any worker's share depends upon the relation of the number of workers to the amount of capital. Hence, a rise in wages in an industry is at the expense of some other. The reasons assigned were that: "a rise in wages used up profits; less profits drove capital out of industry and lessened the demand for labor and on the other hand, higher wages attracted labor from other trades." (Walker). "The fallacy lies in the confusion of wages and labor cost, which we have seen may not be the same; in the immobility of both capital and labor: capital is not so sensitive that it withdraws so readily, nor do workers change their trades as readily as this theory assumes." (Clay).

Although this theory has not been accepted in its strictest sense for a long time, it is still felt in trade union antagonism to political economy. If political economy proved that by natural law, the amount possible for wages was fixed, then it attacked the fundamental assumption of trade unionism. Therefore, trade unionists were against political economy, and their disfavor has not disappeared with the abandonment of this theory by economists.

The rise in wages due to competition of employers and improved methods of manufacture unaccounted for by the wage fund theory, directed attention to the effect the efficiency of the worker had upon wages. Prices of the finished product being fixed by competition, the employer who could not make and sell at a profit was forced out. Competition between employers keeps wages paid by any individual employer for labor up to a certain mark. The chief way he has of controlling his profits is by so organizing his business that the labor he pays for is efficient.

The weakness of this productivity theory is that it assumes too much for competition. It assumes that employers *will* pay what they *can* pay and that workers *won't accept* any but the *market wage or better.* Both sides stand to lose so much by not buying or selling labor that these differences are adjusted without as much dickering as this theory suggests. Besides, a theory based on efficiency does not account for differences in wage in different trades. A worker in one trade may be as efficient for his work as one in another trade is in his and yet receive less, due to supply and demand, net advantages, etc.

With certain modifications of the theory, probably the basis for wage scales most accepted now is a wage that will cover cost of living. The difference between this and the old subsistence theory is that by "cost of living" the worker means the maintenance of his standard of living. Of course, there are as many standards of living as there are people or groups and the standard changes. The luxury of automobiles has become a necessity to many classes of workers; meat every day is a necessity for American workers; it has always been a weekly luxury for English workers and is a rarely tasted delicacy to many groups of European workers. By standard of living, we mean the worker's own accustomed standard. Often he prefers individually, or in groups, to be without work at all temporarily rather than accept a reduction in his usual wage, which in terms of current prices, will mean less goods.

It is a fact, though, that wages for certain classes of workers have fallen below an amount necessary to maintain life and efficiency of the worker. Out of this has grown the modern demand on the part of unions, and to a certain degree of society in general, for minimum wage

laws. In this way, it is figured that if an employer is not efficient enough to run his business without the continual expense of the health of workers, he will have to get out of the field and should, as he is a parasite on society or other industries.

It seems undeniable that the higher the grade of workers in health, in intelligence, skill and efficiency, the higher the wages can be in a given country, and such labor swells national income as much as an abundance of capital and good national resources.

Reasons for the Difference in Wages.

We are so accustomed to great differences in wages that we take them more or less for granted, but there must be reasons for them.

Some men have great talents for planning and carrying out undertakings, which makes them valuable, and in as much as these qualities are scarce, they, for these two reasons, command large wages. Others can carry out small undertakings, or work successfully as subordinates of the first grade men. Still others have skill in craft or clerical work. A fourth grade have physical strength and endurance but little else, while the last rank are incapable of mental or physical labor of any continuous kind. All these grades merge into the others, and tend to grow more common as we go down in grade. A man may, by training or by competition in a scarce labor market, rise to a higher group; may by lack of application or over supply in his own class, fall to a lower. The better workers in each class receive the pay of the lowest in the class plus more, according to their efficiency.

Differences in wages are further accounted for by differences in supply and demand. Special talents, as said before, get better wages. Some trades tend to become overcrowded, as clerical workers, and so command less wages.

Adam Smith said, "A man is, of all sorts of luggage, the most difficult to be transported." Ties of many kinds tend to keep workers where they are. This is being modified by modern transportation facilities and knowledge of other sections, but what is true in the United States is not so true of other countries.

A difference in the cost of learning trades as a reason for difference in wages, is plain enough—the doctor must have a better return than the street cleaner, to make up for four or five years against four or five hours training. What we should remember is that this difference is self-perpetuating; the doctor is then able to give his child the expensive training for a better paid job that the street cleaner is not.

Other points, such as cost of living, danger and risks, agreeableness and social esteem, chances of promotion have already been mentioned as determining wages.

General Trend.

The general trend of wages over a long period of time has been upward. As to the significance of this, there is a difference of opinion—some point to the material comforts and even luxuries enjoyed by all classes now as compared with earlier conditions and in shorter hours, more recreation and education. Others say that the monotony of work, the crowding of workers in cities and the fact that wives and children must help with the family income quite overbalance any material gains. Besides, workers' families are smaller, so that the wage is distributed over a small number of people. (Roberts).

The socialist unions find all remedy in re-distribution, but as attractive as that must sound to the person with little when he contemplates the person with millions, one must face the fact that a "limitation of the maximum individual income to that of the highly skilled worker, say $3,000 per year, with a pro rata distribution of all excess to those having incomes equal to or lower than those of such skilled workers, would add not over 25 per cent to the lower incomes." (Rorty).

Remedy is to be found in greater industrial progress. We must learn to utilize our industrial organization without so much waste and loss. The war taught us what we could do to increase production: 2½ times what it was before and with nearly three million men withdrawn from industry into the army. We shall have to learn to practice more of the efficiency of which we are capable in special crises. More goods, if they are efficiently produced, mean more for everyone.

Compact Centrifugal Pumping Unit.

Allis-Chalmers Mfg. Company, Milwaukee, Wis., have recently brought out Type SSU centrifugal pumping units, which are combined motor and pump units of simple and compact design, the complete units being not much larger than a motor alone. Both the pump and motor parts being built by the same manufacturer eliminates divided responsibility for performance, it is stated.

The unit is close coupled by fastening the pump impeller to one end of the extended motor shaft, and the pump casing is bolted to a special integrally cast extension of one of the motor end housings, providing simple construction and proper alignment between the pump and motor; also, a base plate, coupling and pump bearings are not necessary, it is pointed out. The motor bearings, which are the pump bearings as well, are over-size Timken tapered roller bearings, mounted in dust and grease tight housings. The pumps can be used with from one to 7½ horsepower motors.

A Lock Hook for Heddle Frames.

A new patented lock hook for supporting heddle rods is being manufactured by the Steel Heddle Mfg. Co., Philadelphia, Pa., makers of flat steel heddles. The new hook is one which locks itself onto the heddle bar when in place on the loom, and was designed specifically to overcome the difficulties experienced with the older method, it is stated. In construction it resembles a common wood screw, minus the head, and with a flattened shank. This shank is notched to a depth of ⅛-inch to accommodate the heddle bar, and when the latter is in place a small notched lock bar fits snugly over the top of the heddle bar, holding it firmly in place. The locking bar is under strong tension and may be easily released with one hand. A noteworthy feature is that the heddle bar can be released and removed from the hook with only a ⅛-inch forward movement of the bar, so that the adjustment of adjacent heddles may be accomplished without disturbing the entire bar.

New Ludlum Publication.

Ludlum Steel Co., Watervliet, N. Y., have issued a treatise on "Nitralloy and the Nitriding Process," which is available upon request to the company. It describes the new nitriding process for the hardening of steel, and is published to acquaint prospective users of the steel and of the case hardening process with practical information necsary for their successful employment.

The Art of Observation

Large Savings Made Possible Through Its Practice in the Mill—Proper Coordination of the Eyes and Brain a Great Asset to the Operating Executive

BY R. A. SONIAMAN.

Every day in every textile establishment, there are losses taking place which could be minimized or even eliminated by an observing executive. Specific instances will be cited later.

The power of observation can be cultivated to a high degree of efficiency if there is a determined effort made to acquire it. The very first habit—a mere physical one, though invaluable—in the acquisition of efficient observation is that of looking to the right and to the left as one walks up or down the alleys of the mill. The idea of thus craning the neck is for the opportunity that it gives for noting what is actually going on in the room—whether machinery is running or stopped, whether the help are attending their duties or not, whether the machines are properly supplied with material, and so on through the whole list of matters important to good management.

Thus, matters requiring immediate attention can receive that attention on the instant by the observer or he can summon some one else to do it. If the trouble is not urgent at the moment of its discovery, it can lay over until there is time to correct it. But the all important thing is that whatever it may be that requires looking into, it has been observed by the executive.

The second important habit—also a physical one—to make the results of observation effectual, is that of action after a defect has been discovered. A word of caution here. Many men becoming enthusiastic over the possibilities of the—to them—new discovery, wonder why it is that after they have pointed out all the various leaks that they believe they have found to every Tom, Dick and Harry in the place, they do not get better results. The answer is easy! They do not go at the matter with tact. A good manager will bring the results of his observation to the attention of the proper parties in such a manner that the faulty condition is corrected without any undue friction having been created.

In order to give some specific instances showing how an executive can make savings—and big savings, sometimes—in the manufacturing process, two departments of a yarn mill will be cited: spinning and spooling. The principle, however, is equally applicable to every department from raw cotton to the finished material.

Obviously, one of the first things that an executive should drill himself into in this art of observation, when he is in the spinning room, is that of noting whether any of the frames are unnecessarily idle. Bunching the doffing so that the doffers are busy for several hours at a stretch and then are idle for a couple of hours (or swimming in the mill pond as the writer once saw them) may be fine from the doffer's standpoint; but such a procedure can only be looked upon as a reducer of production when frames here and there are stopped 15 minutes or more waiting to be doffed. A re-arrangement of the doffing schedule can be urged that will make the needless stoppages a negligible factor.

The following illustration will show how a superintendent may sometimes see a thing that the room officials have momentarily overlooked. In a fairly large spinning room in which it was the system to have two roving carriers, each being allotted one-half of the room, the writer has seen frames stopped for lack of roving at one end of the room, while the same hank roving was piled two rows high on frames at the other end.

Of course, this situation would not prevail beyond a brief time, fifteen minutes to a half-hour, maybe less; but happening every now and then it becomes a leak that is well worth some effort to plug.

Another feature to be watched which has a considerable bearing on production is that of the running condition of the yarn on the frames. Are there few or many breaks? If many, are they creel breaks or laps? If either, what is the cause? The attention of the room executives is then immediately drawn to the adverse condition, and steps are taken to correct the trouble.

When there is a diversification of counts in the spinning room, with different hanks in the creels, and perhaps several kinds of cotton, there is a big field for the quick-eyed manager in the detection and prevention of mixtures.

A glance over the roving of the machine stopped for doffing may reveal two shades of cotton—a roving mixture. A bobbin picked out of a box here and there before it is delivered to the spooling room may disclose a wrong crayon mark that may cause a bad mix in subsequent departments. The same opportunity prevails where different colored tickets are used to designate the counts of spun yarn. In connection with yarn mixtures, it may be said that every mixture detected in its incipient stage or before it gets into action at all is a saving in dollars and cents to the firm. This statement will be borne out by every operating executive.

Equally true is the saving that can be effected by having all the machinery started on time, morning and noon. Times without number the writer has gone into the rooms at starting time and has heard the whirr of starting machines here and there long after the starting whistle had blown. It will be readily seen how production, and lots of it—is lost here.

"But one man can't be everywhere at starting and stopping time?" someone complains. Quite true! But there is no necessity for a capable man to be in all places at one time. If he will simply make it a point to be in a different department or in a different part of a room at each starting and stopping time, his presence will act as no other stimulant can on his subordinate executives. A cautionary word to this one and that one about a frame not started on time will keep them all keenly anxious to see that the machines are promptly started.

The quality of a product is always a source of pride to an able executive, and in the spinning as in other departments there are many places where the sharp-eyed manager can aid in keeping his corps of assistants on the

alert. For instance, it may be a rule of the mill that no piecing must be more than an inch or an inch and one-half in length. Every day, unless strict oversight is exercised, there will be infractions of this rule. If any reader doubts this statement let him take a casual stroll through the spinning department—unannounced.

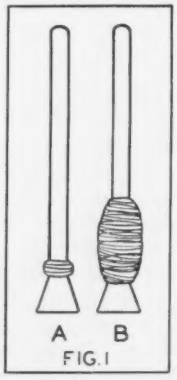


FIG. 1

Breaking strength can be seriously affected by soft yarn, and a glance at the bands will often disclose an offender before it has a chance to work any mischief. Careless cleaning, clearers not picked often enough, strong winds blowing through windows, doors, or other passages, are productive factors in loading the yarn with fly waste, and the detection of these evils and their reduction is well worth looking after.

Another production leak that often escapes the executive force in a room and one which the superintendent can often immediately "spot" when he enters the spinning room (if he has trained himself into looking for it) is that of spindles standing idle for hours at a time because of the carelessness of the bander, or because the latter cannot

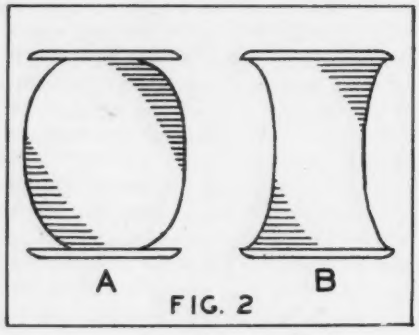


FIG. 2

keep up with his work. Here is a condition that should be instantly drawn to the overseer's attention. It may be entirely a fault of the bander, or the bands may be of poor quality, the humidity may not be just right, or it may be something else. But whatever the cause, the condition is remediable, and the longer it exists the greater the production loss.

An executive who is zealous in getting the utmost yardage on his spinning bobbins, in conformity, of course, with good running, will watch that his bobbins are as large in diameter as is consistent with the ring used .

An occasional glance at what the oiler is doing may serve to ward off premature wear of parts through careless oiling, and will also save the firm a good bit in the oil bill through a word of caution against the too generous use of the oil. Tips of oil-cup nozzles are often in such bad shape that the oil flows like water from a hose.

The passage between the spinning room and the spooling department is bristling with possibilities for an executive who will develop and exercise his powers of observation. Particularly in the storage of the yarn at either terminal is there afforded an excellent opportunity for occasionally looking over the product to adjudge its condition, to gauge the running property of the machinery, and to note the degree of cleanliness of the product. And, not to forget the everpresent probability of a mix.

One of the evils in a spooling department that is not equipped with automatic or semi-automatic knotters is that of long knots. The reduction of these either through a more rigid system of follow up by the section hand or by supplying the knotters can be decided on by the executive in due time.

Fanning or blowing off their machines is a most obnoxious fault often committed by unthinking spooler tenders. This practice is a most prolific source of fly waste

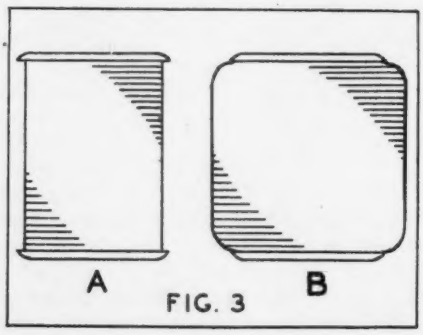


FIG. 3

becoming incorporated in the product—a condition for which the spinning room is often unjustly censured.

Hundreds of dollars can be saved at the spoolers by a keen eyed, quick acting manager. This statement applies to the pernicious habit infallibly acquired—if not checked—by nearly every spooler tender working on ply yarns of pulling off a considerable portion of the material at the bottom of the depleting cops or bobbins. Time is money to a pieceworker and it takes time to piece on the small bobbins or cops. Accordingly, wherever and whenever the operatives can "get away with it," they will pull an excessive amount of the residue off. Fig. 1 shows at *A* the size which experience and tests have shown to be about right to pull off; at *B* the size that will be pulled off, if permitted.

If the spoolers are of the upright spindle type there is always an opportunity for the superintendent to watch out for the traverse that is altogether too short, *A*, or too long, *B*, or which is running too high, or too low, and which result in spools like those in the sketches, Fig. 2, which are sure to run bad in the following process, and may become entangled, thus resulting in waste—in other words, a loss, and a tangible one, to the concern.

Among other points that will bear good results if followed up, are spools not filled full enough, *A*, and spools overfilled, *B*, Fig. 3. In the former case, there is a production loss at the spoolers on account of the extra doffing; less pay to the operative on account of the loss from the operation because of the frequency with which the small spools empty; and finally there is an increase in the

number of knots tied. On the other hand, overfilled spools are a fertile cause of waste because the yarn has a tendency to slip over the heads of the spools.

Innumerable instances could be cited like these throughout the mill, showing what a very valuable habit the power of observation can become to a progressive executive, and the savings that he can effect for his firm by the judicious exercise of this desirable acquisition.

Finishing Linen Cloth and Toweling

BY T. WOODHOUSE AND A. BRAND.

Linen, in common with other textile fabrics, has its own particular percentage of natural or hygroscopic moisture, but this amount of moisture is insufficient to affect the finishing processes to the required degree. Fabrics that are finished in their naturally dry state in either the mangle or calender very quickly re-assume the condition and appearance obtaining in the loom fabric, and it is found impossible to remove the marks of creases. Hence it is necessary to add moisture to the loom fabric before the finishing process proper, and the process of applying this addition to the natural amount of moisture goes under the general term of damping or conditioning.

For cold finishes, such as are given on the beetling machine, or as result from a cold nip in the calender (as is practised for certain heavy flax cloths) less moisture is required than for hot finishes such as are usually obtained in the calender and in the mangle. In the case of the calender, heat is generally applied to the fabric through the medium of a steam-heated roller, and in a mangle a considerable amount of heat is generated in the fabric by frictional effects occurring in the folds of the fabric during the finishing process. Hence, where either of these finishing methods is employed, a damping process is essential. On the other hand, the process is unnecessary where goods that have been bleached are taken directly from the tenter-frame or from the starch mangle in a damp condition to the calender. This condition does not often arise in the finishing of towel fabrics which are seldom starched. It is relatively common in the treatment of damasks, which, after being bleached, are starched and partially dried, then taken to the finishing machine proper with the necessary percentage of moisture left in the fabric.

The damping machines in general use are of two distinct types, distinguished by the method of breaking up the water immediately before its application to the cloth, and known as brush damping machines and spray damping machines. The use of a brush or brushes tends to the production of large drops of water, which give rise to a tendency towards inequality of damping, but, on the other hand, the brush machine is advantageous when it is desired to apply to the fabrics light starch or other finishing mixtures in order to add weight to the fabric or to improve the finish or both. The spray damper is the better of the two for wide goods, but its use is restricted to pure water damping, as the use of starch and similar compounds tend to close up the small diameter holes through which the water is forced when being formed into spray.

After the water is applied, the fabric should lie in a loosely folded condition for 6 to 8 hours in order to allow the applied moisture to spread and penetrate the fabric as thoroughly as possible. In the case of heavy goods it is advisable to allow the fabrics to lie at least 12 hours. Those in charge of some finishing departments arrange matters so that the calenders or finishing machinery proper is always 12 to 14 hours behind the damping machines. Colored goods have a tendency to bleed, i.e., the dye from the colored threads may spread to the undyed yarns in proximity, if too short a time elapses between damping and finishing. For ordinary finishes, the amount of moisture added is from 5 to 6 per cent of the weight of the fabric. This amount may be reduced to 3 or 4 per cent in the case of goods to be mangle finished, and it may be increased to 9 or 10 per cent where atmospheric conditions are such as to cause rapid evaporation of the added moisture. The speed of the machines varies according to the weight of the fabric and according to the amount of moisture it is desired to add. For light fabrics and light damping, the speed may be 150 to 160 yards per minute, reduced to 130 or 140 yards per minute when heavy goods requiring a greater percentage of moisture are treated.

Brush damping machines are made with single and with double brushes applying moisture to one side only of the fabric, and with double brushes in which the path

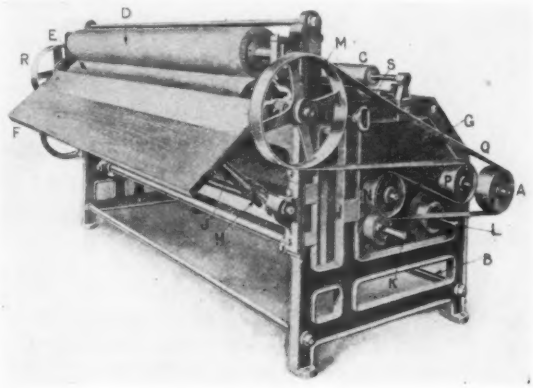


Fig. 5.

of the cloth through the machine is arranged to permit moisture to be directly applied to both sides of the fabric. A typical machine of the latter kind is illustrated in Fig. 5. The fabric to be damped is laid on the floor or in a wooden tray at the back of the machine below the tension or guide pulley *A*, and close to the rail *B*. One end of the fabric is led below the rail *B* and then approximately vertically upwards to the guide roller *C*, whence it moves almost horizontally to the nip of the upper and lower drawing rollers *D* and *E*. In some machines, the damped cloth is allowed to fall directly to the floor after it emerges from the drawing rollers *D* and *E*, but, in the machine illustrated, it passes over the plaiting-down or faking board *F*, oscillated about its upper edge by cranks *H* and connecting arms *J*. The cloth is thus built up into loose folds either on the floor or in a wooden tray, situated almost directly under the faking board *F*.

In moving upwards through the machine, the cloth passes centrally through a two-compartment water-tight box or casing, one end of which is seen at *G*, Fig. 5. In-

side each compartment is fitted a brass roller, the arbors of which project through glands fixed to the outside of the casing *G*; two of these arbors are seen at *K* and *L*. Immediately above each brass roller is located a revolving brush, the projecting bristles of which are in contact with the upper surface of the brass roller. The brushes are belt-driven from the lower drawing roller *E*, and the complete drive is seen in Fig. 5 where the pulley *M*, keyed to the lower drawing roller *E*, drives the two brush pulleys *N* and *P*, by means of of the belt *Q*, tensioned by the adjustable jockey or stenting pulley *A*.

The brass rollers *K* and *L* are partly submerged in water, maintained at a constant level in the bottom of the casing *G* by the operation of a ball-cock controlling a supply tank or cistern situated alongside the casing *G*. As the rollers *K* and *L* revolve, the film of water picked up by their surfaces is brushed off in spray form by the rapidly rotating brushes on the same shafts as the pulleys N and P, and thrown onto each side of the fabric as it passes upwards to the guide roller *C*. The amount of water thus

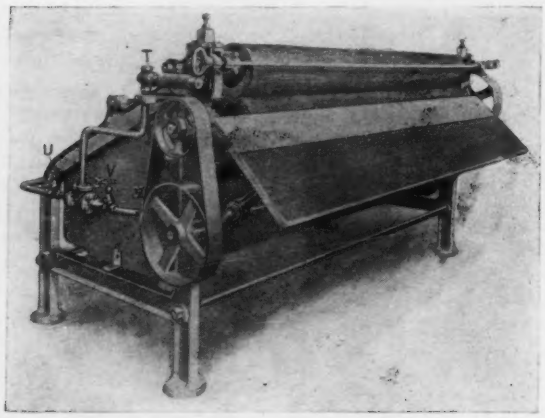


Fig. 6.

thrown on the fabric is regulated by a number of factors, viz., the relative speeds of the brass water-rollers, the brushes, and the fabric, as well as by the depth of immersion of the brass rollers in the water in casing *G*. Further control of the amount of water reaching the cloth is obtained by raising or lowering a wooden mask or float-box, the sides of which are situated between the brushes and the fabric.

The main driving pulleys are seen at *R*, Fig. 5; the brass rollers for conveying the water to the brushes are driven by gearing from the brush roller arbors at this side of the machine. The driving belt may be controlled from either end of the machine; one of the handles is seen at *S*.

Fig. 6 illustrates a typical double spray damping machine, which is similar in action and construction to that already described except for the method of producing the spray of water. Water is delivered to the supply pipe *T* by a cistern or other means giving a pressure head of about 15 feet. Since a column of water one square inch in section and one foot high produces a pressure of 0.434 pound per square inch, the pressure equivalent to this head is 15 $\times$ 0.434 = 6.51 pounds per square inch. The water under this pressure is delivered to the two spray pipes through the regulating valves *U* and *V* and is forced upwards through a series of small holes in the spray pipes. Occasionally, the spray thus formed is further broken up by interposing brass wire gauze of fine mesh between the spray pipes and the fabric. The path of the cloth through the machine to the drawing rollers and plaiting down apparatus is such that the spray pipes act respectively one on each side of the fabric.

A third type of damping machine which is occasionally employed is that in which a pump is used to supply the water under pressure. In this type of machine the cloth passes over and under a series of five wooden tension bars, then approximately horizontally over a guide roller to a pair of drawing rollers. Immediately below the approximately horizontal portion of the fabric is situated the water-box, which has an adjustable top or roof, in halves, hinged at the outsides. The aperture between the two halves can be adjusted in dimension to regulate the amount of spray which is allowed to pass through to the fabric. Near the bottom of the water-box is a supply-pipe provided with three or more jets through which the water is forced at high pressure onto one side of the box. The net effect of the high pressure, the fine jets, and the impinging of the water from the jets onto the side of the box, is to break up the water into a very fine spray which rises as a vapor through the aperture in the roof of the box.

In this machine, as well as in the type illustrated in Fig. 5, provision is made to stop and start automatically the flow of the water simultaneously with the stopping and starting of the machine; this course prevents waste of water, and also obviates an excess of moisture at any part of the fabric.

(*To be continued.*)

Carolina Dyeing & Winding Co.

A new concern, Carolina Dyeing & Winding Company, will lease a plant to be erected near the Catawba River at Mount Holly, N. C. The company is incorporated in Massachusetts with a paid in capital of $150,000. The concern will install machinery for dyeing and winding yarns for weaving and knitting mills on a commission basis; delivering cotton and rayon yarns in any form needed by the mills for all types of fabrics. Rayon yarn will be available on cops, cones, beams, or in skeins, dyed or in the natural color, sized or unsized. Cotton yarns can be dyed and delivered in skeins, chain warps, beams or packages. Equipment will be installed for making voile twist and other special twists involving both rayon and Celanese yarns, and for the delivery of this material in convenient form. In addition to the service to weaving and knitting mills, the company will also render similar service to the many interests concerned in the sale of cotton, rayon and Celanese yarns.

The president of the corporation is Edwin F. James, who was for a number of years one of the owners of the Textile Silk Dye Works, Philadelphia, and previously district sales manager for E. F. Houghton & Co., with headquarters in Atlanta. He will reside in Charlotte. Royal Little of Boston, is treasurer. Mr. Little is also treasurer of the Lustron Company, and of the Special Yarns Corporation, dyers and converters of rayon and Celanese yarns. Mr. James states that it is felt the facilities provided by this new plant will serve to attract to the Piedmont section plants for weaving and knitting specialties and fancy fabrics, as well as the more staple lines.

Creating a Safety Mind

by

W. M. McLAURINE

A Study of Rates.

One of the most impressive factors that can function in creating a safety attitude in a cotton manufacturer is for him to secure the information on which his present compensation rate is based. This can be secured by writing to the insurance carrier, but it will be so involved that it will be difficult to understand, hence I suggest, in order to bring it home to your own case, that you ask the safety engineer of the insurance company to bring it to your mill and then have him explain it to you.

You will find that there are two great factors that determine your rate, the physical condition of your plant, and the experience that you have had in operating your plant. By experience, I mean the cost of the serious cases, the non-serious and the medical.

In this study you will be able to see a word picture of the physical condition of your plant—where it is weak and where it is strong. You can see instantly where you are properly guarded and where you need further protection. You can see how your mill ranks with a standard or theoretical 100 per cent mill.

You will also see that your physical rating may be 100, up or down and then there are certain credits that can modify this figure. A standard safety organization gives you a credit of five per cent; a standard medical kit, nurse, hospital equipment, gives you a further five percent; the effectiveness of your safety organization, plus the medical kit, hospital, etc., can give you a further varying amount up to ten per cent. In other words, it is possible for a mill to reduce its physical rating 20 per cent on safety organizations and their activities.

The physical rating of your plant, less your safety credits, gives you the net physical rating which operates on your base rate and gives you your plant rate insofar as physical rating is concerned.

For example, suppose the gross physical values assigned to your machines, elevators, etc., amounted to 110. This would show that your hazards were above normal and that you should do something to bring them down. Again, suppose your credits for safety, etc., showed only 3, this would indicate a poor safety organization and poor work. 110 less 3 would give you 107 as the net physical rating of your plant.

In Georgia the basic rate in cotton spinning and weaving mills is 56. 107 per cent of 56 equals 60. Thus you would see that the physical rating of your plant and the effectiveness of your safety organization gave your plant a rating of 60 or four points above the normal basic rate.

Now stick this 60 rate back in your mind for a little while and we will talk about the experience that your mill has had.

Every compensation insurance premium that your mill pays, carries with it two parts—the overhead, which the insurance companies charge for caring for your accidents and the part set aside to pay the losses actual and incurred. In Georgia at the present time the overhead is 43.5 per cent of the premium, and this leaves 56.5 per cent for losses actual and incurred. If your compensation policy costs $1000 then $435 is set aside by the insurance carriers as their part, while $565 is set aside to care for the losses of your mill.

If the losses at your mill fall below that, you are supposed to get a credit experience rating, if they go above, you will likely get a debit experience rating. In this calculation, as in physical values, 100 is taken as the norm. Your experience is 100 or up or down according to the costs of your accidents.

This cost is divided up into serious, non-serious and medical. In Georgia the pure premium on cotton spinning and weaving mills is 36 cents of which, serious takes 9 cents, non-serious 13 cents and medical 14 cents. This will give you an idea of the distributive ratio of the costs.

From the rating sheets which we have been discussing you will notice that all costs from the experience plan are divided up into normal and excessive costs. By the normal costs I mean the average costs determined by the insurance companies to care for any particular accident or injury; by excessive costs is meant the costs above and beyond the normal costs.

This rate sheet will show you what your normal costs are, and what your excessive costs are. It will also classify your serious, non-serious and medical costs. All of these facts will give you comparative figures which will enable you to locate the relative standing of your mill from an experience basis. Through serious calculations, based on cost factors, finally an experience rating figure will evolve, based on 100 per cent.

If the experience at your mill is bad you will have an experience above 100; if good, you will have a rating below 100. For the sake of carrying on our scheme, suppose your experience per cent works out 115, which indicates a bad experience. Now we go back to our 60, which was the basic rate modified by the net physical rate, and multiply this by 115—our experience ratio—and we get our final mill rate of 69, which is 13 points above our base and indicates bad conditions.

For the sake of another example, let us suppose that our physical rating is 60 as we indicated, but the experience is good, that is, that losses to the insurance company are low; suppose our experience percentage figures out 80. By the same method we take our 60 and multiply it by 80 and get a mill rate of 48 which is 8 points below the basic rate.

The point that I am trying to impress is that experience is a great factor, indeed the greatest factor, in determining rates. This is where we must focalize our energies and attention. There is another part of this program. When the safety engineer came to your plant and brought the rating sheets, he brought only aggregate costs. It is now necessary for you to get a detailed accident report for your mill for the year and study this, noting each accident, how it happened, how it is classified, what it cost, time lost and many other things that your own inventive mind will indicate.

If you have a good safety organization you already have done some of this. You perhaps have not figured out the cost and classification.

There are many details in individual rate making that I have omitted, as they are not essential to this study. I do believe, however, that these studies will give you an insight to the cost factor and the determining influences in rate making that will be of value to you. The actual study is not so detailed as the description of it.

Accidents are too frequent and too costly and something must be done to reduce both. This appeal is made through the cost or money phase of the problem, although it is not the most important phase. Most of us have grown material in our thinking, so we place emphasis upon a subject according to its money value.

Compensation insurance in Georgia costs the cotton mills approximately $800,000 annually, and it is increasing. Who is to blame, and how can it be checked?

CURRENT TOPICS

Government in Business.

It is an American tradition, often broken, that government should keep out of business; that, in the words of Abraham Lincoln, it should do nothing which can be done at all or as well by private agencies. It is a tradition which has been adhered to, in theory, by the Federal Government, which always has stood against the principle of public ownership and operation of business enterprises. The principle has been adhered to less in theory but actually more in practice by the State Governments. Many of the States have embarked at sometime on public ownership adventures and they have done it openly and avowedly. Most of these excursions have been failures. So disastrous were ones during a pre-Civil War period when the advent of railroads brought about feverish building of public works that the States were taught a lesson which still has weight with them.

The principle has never counted for much with municipal governments which necessarily must engage in many public service enterprises. A sort of epidemic of municipal ownership of public utilities, such as lighting plants and street railways, spread over the country in the early years of this century. It has not yet entirely run its course, though it is the rare town or city which now would incur debt for such a purpose. More are going out of the public utility business, by selling or leasing properties, than are entering it. Even with the best management, the cost of operating small and isolated municipal lighting plants are now by reason of advancement of the art enormously above what is charged for current by private companies operating via big central stations or congregations of interconnected plants.

Government ownership on a national scale used to be an academic question only. Discussion of it revolved usually around the railroads and telegraph and telephone lines. But a bit of war experience with Government operation of railroads and telegraph systems convinced the public that the contentions of the old-time theorists were fallacious.

But the question of government ownership now looms nationally in a more formidable way than ever before. Discussion of it revolves in the main around electric power. Shall the Government own and operate power plants for producing energy for sale? It already owns one, at Muscle Shoals, which was erected for a purpose other than producing energy for sale. It is proposed that the Government build high tension transmission lines connecting the Muscle Shoals plant with consuming centers. It is proposed also that the Government erect other plants, notably one to be operated in connection with the Boulder Dam enterprise on the Colorado river in the Southwest. This would be one of the world's biggest water power plants.

There is a good deal of argument for the program, which is one of government ownership. If the adventure stopped with what is now outlined, no particular harm and perhaps some good would be done. But would it stop there? Almost certainly not. The inevitable tendency of government ownership is towards governmental monopoly in the fields entered.

This is illustrated by a government ownership operation in a realm of transportation. During the war the Railroad Administration established barge lines on the Lower Mississippi to relieve the strain on the railroads. These lines have since been maintained, and enlarged upon considerably, being extended to the Warrior river in Alabama. There is almost no other water traffic on the streams operated upon by those lines. And there can't be much privately handled traffic, for the reason that the government lines have been operated at large losses. No private operator can compete with the U. S. Treasury. The demand now is that the Government's barge lines be further enlarged.

The continuance of the Government in merchant marine operation has had similar effect on private enterprise in that realm. Private enterprise can't compete with a pub-

lic agency which can draw on the Treasury for 50 cents or more to cover losses on every dollar's worth of business done. The Government must do it all in the end or none. The demand now is that the merchant marine adventure be given perpetuity by letting the Shipping Board draw on the Treasury for funds with which to build new ships.

Such demands come from quarters other than ones wherein government ownership is supported as a principle. In fact, the principle is rarely discussed. All of these Government ownership adventures are supported as expediencies. Advocacies of them are not based, as of old, on the contention that "natural monopolies" should be owned and conducted by the public. These adventures are maintained or entered upon as ones in competition.

Those who rationalize their support of them hold that regulation of public utilities has failed and is futile. They know that for the present it is useless to ask that the public take over and operate all of them. The public would take such a proposal as either a joke or a bolshevistic idiocy. Hence the rational advocates of government ownership would have government own and operate some of them in order to insure and not to obviate competition. It is a plausible argument. For example, there are many seeming advantages to be expected from the public's possession of "key" links in what perhaps is tending to become a national monopoly of electric power. Government barge lines on the big streams might be used in keeping the owners of the railroads from charging the public too much. Government ocean-going ships afford a sort of protection against foreign shipping combinations which possibly might injure our foreign trade as well as "hold-up" our producers of export products.

But, as stated before, government can't compete. Generally speaking, it must do all or nothing. When government makes the first step into business, a second step becomes inevitable, and then a third, and on and on, unless government withdraws entirely.

Hence, these government ownership proposals should be adjudged with reference to basic principle as well as incidental expediencies. Already, while abjuring the principle, the Federal Government has gone enormously into business. A recent study showed that today Uncle Sam conducts for the public somewhere virtually every known kind of business. This genial old gentleman even runs country clubs, and probably beauty parlors. He operates railroads, steamship lines, hotels, farms, dairies and garages, while virtuously pretending that all such things should be left to private initiative. Principle is no insuperable bar to practice. But decision should be made as to principle before entering into practice.

Business and the Presidency.

It looks as if, whatever the turns of the political wheel o' fortune, the next President of the United States will be a business man, a real one and a good one.

At this writing the Republican outlook is decidedly favorable to Herbert Hoover. Coolidge's reassertion of his "do-not-choose" statement should remove any lingering doubt about the intentions of the present holder of the office. Charles Evan Hughes has reaffirmed a position of negation even less amenable to change than that of Coolidge. These two men are out of the picture.

It is undeniable that their elimination has strengthened for the present the outlook for Hoover, who in all probability will lead in the first voting in the Republican National Convention. Under certain circumstances this, however, may be a disadvantage. A candidate who leads on the first ballot in a convention and fails to get the nomination then, or on the next few ballots, rarely wins. For all opposition naturally combines to head him off. The leading candidate must have the nomination "sewed up" at the start in order to have a reasonable chance of winning.

The present prospect is that only two other persons will go into the convention with more than "favorite son" strength. These are former Governor Lowden of Illinois and Vice President Dawes, whose forces will be in large part identical. Only in case of a deadlock are others than Hoover, Lowden and Dawes likely to have a chance. Since majority votes prevail therein, Republican conventions are not easily deadlocked.

The group of three from which the Republican candidate in all probability will be chosen are business men of the first rank. While two of them are slightly heretical as to certain current issues, all of them are essentially conservative and sound in their views as to basic questions that have to do importantly with business and industry. None would be likely to make any great change in present national policies.

The Democrats are apt to nominate a business man too. Aside from public life, which he has pursued virtually as a vocation. Governor Alfred E. Smith of New York has engaged solely in business. Except maybe as a politician, he, in fact, is the least "professional" of all the outstanding bidders for the Presidency. If it turns him down, his party may choose some man of even greater identity with business; for instance, Edward T. Meredith of Iowa.

Insofar as the Presidential prospect shapes up now, there is nothing in the outlook which should nurture the traditional fear and hesitancy which is felt in many business quarters when a change in the Presidency impends. Not often has there been a less seeming chance of a violent upheaval.

Ten Years of Bolshevism.

The tenth anniversary of the fall of Kerensky and the rise of Lenine and Trotsky in Russia has been the occasion for many reviews of the most extraordinary governmental experiment of modern times. When Lenine and Trotsky became dictators of the realm long ruled by the czars holding absolute power, no one dreamed that even Russia would yield for a period so long to a rulership so strange. Lenine is dead, Trotsky is in retirement, but the Russian soviet survives. From all accounts, the bolshevists seem to be more strongly entrenched than ever.

What is the answer? Probably this: While the bolshevists are entrenched, bolshevism has fallen even in Russia. Lenine—a man, whatever his faults, of powerful mind and will—readily learned that communism could not be established quickly, if at all, among a numerous people. The greater part of communism was abandoned before he died—by Lenine himself. A sort of state socialism was saved. But the state now carries on by immediate management not much more of business and industry than

states do in many lands not rated as peculiarly socialistic. There undoubtedly has been a restoration of industry in Russia. Authentic observers report production above that of czarist times. A reflection of it is found in this country. Although its government is not recognized by ours, we have been doing more business with Russia than in pre-war times. More than twice as much American cotton went to Russian mills during the last season than ever went to them in the time of the czars. Cotton growing is again on the ascendancy in Russian Turkestan. The output this year will probably exceed a million bales.

The drift in Russia is towards political and social systems of the accepted sort—but modified to suit the needs of a people whose civilization still is medieval.

Elements of contagion which for a long time seemed to attach to the communistic experiment there were terribly exaggerated. There was never any danger of the disease of bolshevism making headway in this country, or enduring headway in any other country. Even parlor socialism is at the lowest ebb of the century in the United States, and this recession is in much part a reaction from bolshevism. Socialism and communism have many attractions as theories and are fascinating speculations. But adherents of the cult usually run away from its application.

The Supreme Senate.

No provision of the Federal Constitution is clearer or more positive than that which says no State shall be deprived of equal representation in the Senate without its consent. The Constitution itself cannot be changed as to that except by unanimous agreement among the States. The provision is there so that even a minority of one may defend its rights. It thus may be the most important stipulation in the Constitution.

But the Senate has set it aside. It did this when it "suspended" two members-designate pending action on whether they are fit personally to sit in the Senate. Until final action is taken the States from which those members-designate come cannot have equal representation in the Senate. They cannot appoint others to represent them in the interim.

The Senate undoubtedly has the power to refuse admission to anyone, or to expel anyone of its members, for virtually any reason. But it has no legal power of suspension, for such would permit it to deprive a State of equal representation during the period of suspension. Yet its action in the two pending cases is one of suspension. If allowed to become a precedent, it means that a majority of the Senate can do anything it is of mind to. It will be an exceedingly dangerous precedent.

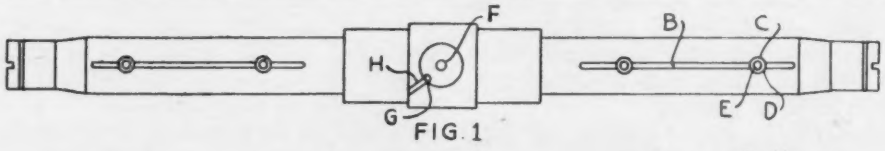


FIG. 1

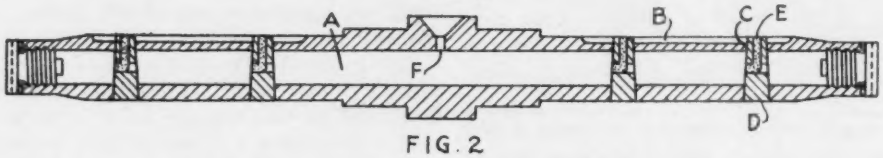


FIG. 2

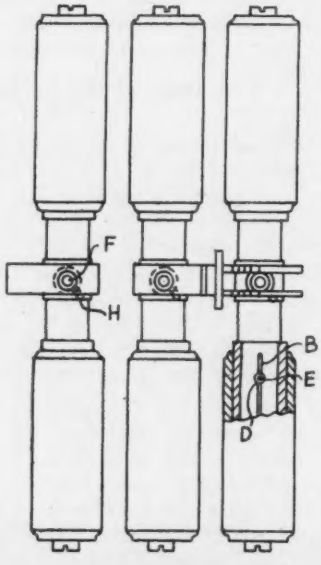


FIG. 3

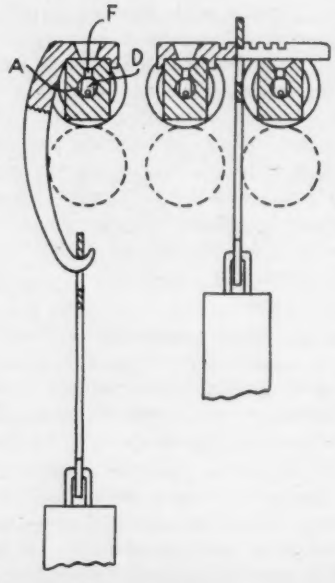


FIG. 4

A New Type of Arbor for Roving and Spinning Frame Rolls.

A new type of arbor for roving and spinning frame rolls, eliminating the necessity of removing the shells for lubricating the arbors on shell rolls, has recently been patented by James R. Grubb, of Abbeville, S. C. Since the frequent periodical lubrication is dispensed with, the inventor points out, the use of shell rolls as top rolls back and middle, as well as front, is made possible. Further, he states, there is even lubrication with no waste of oil, no oil being poured on the rolls, and a reduction in friction with a consequent saving of power. With Mr. Grubb's system, he explains, oiling of the front rolls is necessary only every two months, back and middle every four months, and this can be done while the machines are running.

The principle of this roll is the use of a hollow arbor from which the lubricant is supplied to the bearing surface of the arbor in an even and regular manner, at the same time avoiding waste of the lubricant and contamination of it while in the arbor bore.

The construction of the arbor is shown in the top plan and sectional views shown in Fig. 1 and Fig. 2. The bore, *A*, is threaded at the ends to accommodate threaded plugs with packing washers to provide a fluid-tight closure. Whenever the bore might need cleaning, these plugs may be removed. A narrow and shallow oil distributing groove is indicated by *B*. Feeding into this groove are the openings *C*. The plugs *D* in these openings contains wicks *E*, which conduct the oil from the bore reservoir to the bearing surface of the arbors. In this way, it is pointed out, only sufficient oil to provide the proper lubrication is supplied, and the oil which has been delivered by the wicks cannot return to the bore to contaminate the supply there.

The oil is introduced into the bore through the passage *F*. An air vent is located at *G*, and when the bore is filled, the oil coming up through this vent flows into a small groove *H*, indicating that the bore is filled with oil.

Novel stirrups are constructed to provide for this oiling feature, and are illustrated in Fig. 3 and Fig. 4, the drawings here being practically self-explanatory.

What the Southern Mills are Doing.

There were two general developments in which the southern mills figured during the past month, which are of especial news interest.

On December 10th, at Spartanburg, S. C., the Print Cloth Group of The Cotton-Textile Institute, Inc., held a meeting, which was attended by representatives of more than 3,000,000 spindles on this class of work, both North and South. Walker D. Hines, president of the Institute, addressed the meeting, discussing the importance of adjusting production to demand, and referring to the current statistics which showed an excess of production to demand threatening a serious crisis in the industry. Following the meeting, Mr. Hines authorized the following statement:

It is understood that after the Institute meeting the mill representatives discussed the situation further and practically every mill representative indicated his purpose in view of the emergency to reduce working hours for the time being, beginning December 23rd, by closing at noon each Friday for the rest of the week, and each of a considerable proportion of the mill representatives indicated his purpose to close either all or a substantial part of Christmas week.

Those at the meeting were informed that the Fall River mills manufacturing fabric out of print cloth yarns had already materially reduced their production in view of the reduced demand and this reduction in the case of the Fall River appears to approximate more than 50 per cent of their capacity.

These conditions reflect the new interest the industry is displaying in the statistical information relating to supply and demand which is now currently available. The action taken by the individual mills was definite and gratifying evidence that more attention is being given to an intelligent adaptation of production to present and prospective demand in the face of an emergency. It indicates a tendency toward a flexibility of production based on sound business principles which are followed successfully in other industries.

The other development, which was given considerable daily newspaper publicity, was a proposal for the merging of several hundred or less small yarn mills in the southern section under one operating head. A. E. Ledyard, formerly of Montgomery, Ala., was reported making mill surveys and securing options on properties for Flint & Company, New York investment bankers who have organized and consummated some of the outstanding industrial mergers of the country. No definite announcement as to actual transactions has been made.

There were announcements of a number of new plants in the South during the past month. Those of a spinning and weaving character will be listed here, while the knitting mill items will be found under the heading "Among the Knitting Mills."

In Georgia, A. T. Wilde, formerly general manager of the Acworth Cotton Mills, has formed in Acworth a company to erect a $100,000 plant for the manufacture of high-grade tapestry material for upholstering furniture, bed and table coverings, window hangings, etc. The old Cowan-Moore mill property has been secured, and machinery will be installed therein. A dyehouse will be added.

The details of the addition to the LaFayette Cotton Mills, LaFayette, Ga., are: a two-story addition, 50x132 feet, and a one-story addition, 159x132 feet. Robert & Company, Atlanta, are the engineers.

It is understood that the Whittier Mills, Chattahoochee, Ga., will erect a substantial branch at Douglasville, Ga.

Canton Cotton Mills, Canton, Ga., have installed a second unit of equipment to dye warps with indigo by the continuous method, furnished by Cocker Machine & Foundry Co., Gastonia, N. C.

J. R. Killian, formerly of North Adams, Mass., and C. A. Rhyne, of LaFayette, Ga., have purchased the Georgia Webbing & Tape Company, Columbus, Ga., from C. M. Young and others.

Burlington, N. C., will secure an $8,000,000 rayon manufacturing plant, it has been announced by Junius H. Harden, in charge of the city's new industries campaign. Albert M. Johnson, president of the National Life Insurance Company, of Chicago, is among those interested in financing the new enterprise.

Lexington Silk Mill, Inc., Lexington, N. C., has been incorporated with a capital of $200,000. J. T. Hedrick,

J. V. Moffitt, and J. C. Grimes are among those interested. The plant of the Wechsler Barber Silk Co., Patterson, N. J., has been purchased, and 140 looms will be removed to Lexington, with auxiliary equipment.

The installation of a number of additional looms is planned by the Gastonia Weaving Co., Gastonia, N. C., it is announced by Henry A. Mussard, manager.

W. A. Mauney has purchased the plant of the Mason Cotton Mills, King's Mountain, N. C., at receiver's sale. W. K. Mauney was the receiver.

Arista Mills, Winston-Salem, N. C., is to install the Cocker continuous system for dyeing warps with indigo, furnished by the Cocker Machine & Foundry Co., Gastonia, N. C.

The Burlington Mills, Burlington, N. C., are installing the second standard warper at their plant for handling beam dyed yarn. The equipment is furnished by the Cocker Machine & Foundry Co., Gastonia, N. C.

Chatham Manufacturing Co., Elkin, N. C., plan a three-story addition, to be 112x150 feet, which will increase the capacity of the plant by about one-third. Lockwood, Greene & Co., Charlotte, N. C., are the engineers.

The new weave shed of the Proximity Mfg. Co., Greensboro, N. C., will be two-story, 144x267, of concrete and steel construction. It will adjoin the company's offices. Eventually, 1,000 new Draper looms will be installed, the initial unit being 500 machines. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

Lullwater Manufacturing Company's plant at Greenville, S. C., has been sold to Walter Goldsmith Company and W. R. Timmons. It is understood the new owners will likely change the mill into a loft building for small industries.

Abbeville Cotton Mills, Abbeville, S. C., are carrying out landscape plans and improvements in the village. E. S. Draper, landscape architect and engineer, Charlotte and Atlanta, is in charge of the work.

Limestone Mills, Gaffney, S. C., have awarded contract for the installation of a sewerage system in all houses in the village.

Victor-Monaghan Mills, Greer, S. C., are replacing 250 looms in the Victor plant with new equipment.

Beaumont Mfg. Co., Spartanburg, S. C., is to erect eleven additional five-room houses in the village.

Jackson Mills, Iva, S. C., are erecting a new water tank of 50,000-gallon capacity.

It is understood that Maryland Silk Company, Paterson, N. J., is to erect a plant at Shelbyville, Tenn., and that 50 looms on broad silks will represent the initial installation of equipment, this to be duplicated later. Sidney M. Edelstein & Co., Union, S. C., are the engineers.

Dixie Mercerizing Co., Chattanooga, Tenn., will install ten Cocker high speed ball warpers.

Knoxville Cotton Mills, Knoxville, Tenn., are reported to be planning a $100,000 addition to the present plant.

J. A. Meinhardt Industries, Inc., Anniston, Ala., will install 9,776 spindles for the manufacture of coarse yarns, etc.

From Enterprise, Ala., it is reported that L. A. Boyd and J. L. Warren, of that place, plan the establishment of a 10,000 spindle mill at Enterprise.

Haleyville, Ala., and Albertville, Ala., are both reported active in developing interest in mills in the respective towns.

Montala Mfg. Co., Montgomery, Ala., are installing the following equipment: 16 cards, two slubbers, one intermediate, two speeders, 2,000 spindles, and 48 40-inch automatic looms.

Texas Gauze Mills, New Braunfels, Texas, have been organized with a capital of $425,000. It is understood that 5,000 spindles and 150 looms and finishing machinery will be installed for hospital gauze manufacture. A. W. C. Bergfeld is president and R. E. Kloepper is secretary-treasurer.

Houston Textile Mills, Houston, Texas, will erect a four-story, fireproof warehouse.

Swift Creek Mills, Inc., Petersburg, Va., have been incorporated for the manufacture of cotton goods. W. N. Anderson is president; S. R. Beasley, secretary; and William Earle White is interested.

Commander Mills, formerly Sand Spring Cotton Mills, Sand Springs, Oklahoma, are now in full operation. They are now being operated by Hesslein & Company, of New York City, and Dallas, Texas.

Group insurance for employees has recently been established by the Kindley Cotton Mills, Mt. Pleasant, N. C., and the Tifton Cotton Mills, Tifton, Ga., through contract with the Metropolitan Life Insurance Company, New York City.

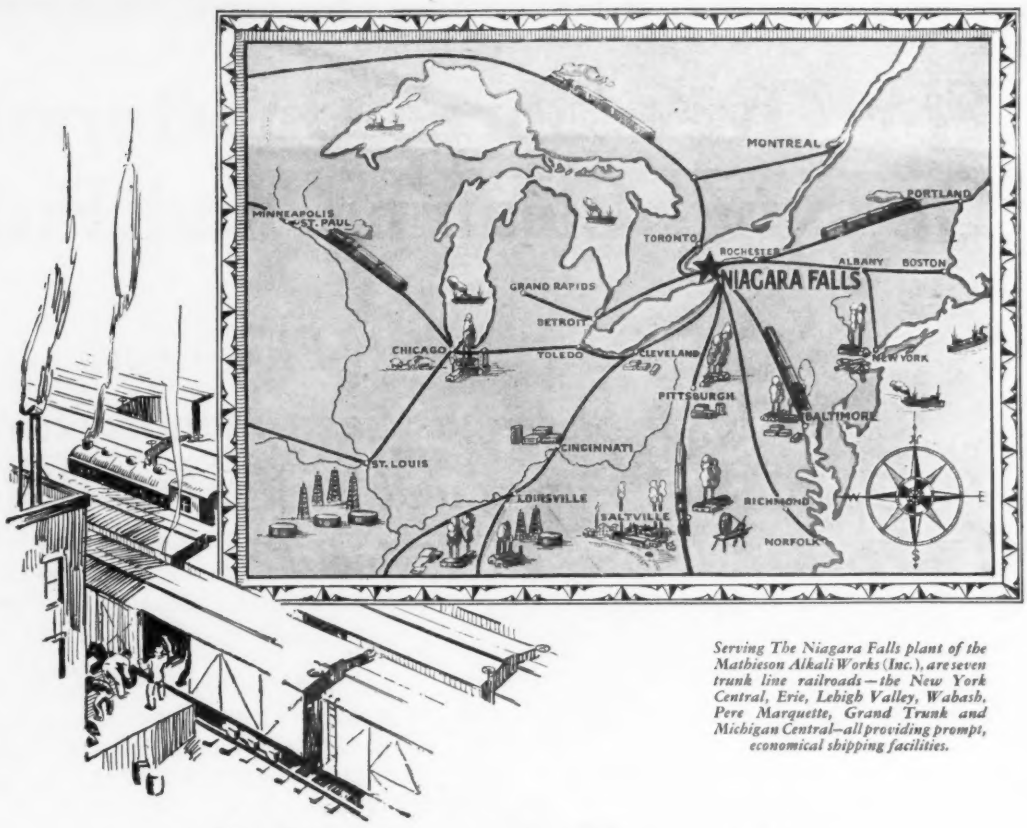
New England Mill Situation.

The prolonged period of quiet business in cotton goods has led to a substantial curtailment of production in New England. Fall River print cloth mills are running less than 50 per cent capacity. New Bedford mills have been stopping looms that were engaged on plain goods for which the market has become unsatisfactory in price and in demand. Mills in other sections have been allowing looms to lie idle when orders expire on goods for which profit margins are too small to warrant any risk of stock accumulations.

It is now pretty widely recognized by experienced cotton goods manufacturers that the early speculative rise in cotton markets was too sharp in view of the supplies in hand and the probability that even with a small crop of 13,000,000 bales or less there would be cotton enough to meet requirements in sight. Even with cotton well under 20 cents a pound in speculative channels there has been so little business in cloths that mills have not been disposed to buy ahead. Shipments of cotton into New England this season thus far are less than a year ago. The cotton basis has been high and the grades offered very good on the medium staples. The offerings of extra staples have only recently been of sufficient volume to cause an easing from the top prices of the season.

During the past month the mills in Maine reduced wages 10 per cent. Some few mills in other states took similar action. The matter of reducing wages in Fall River mills was discussed informally by some manufacturers but in view of the strong buyer market and the slight prospect that any advantage would accrue from a reduction, action to attack the wage scales was not taken. In New Bedford it was said that there was no desire to reduce wages so long as there was so little prospect of being able to offer steady work on a lower basis.

(*Continued on page* 252.)



Serving The Niagara Falls plant of the Mathieson Alkali Works (Inc.), are seven trunk line railroads—the New York Central, Erie, Lehigh Valley, Wabash, Pere Marquette, Grand Trunk and Michigan Central—all providing prompt, economical shipping facilities.

At Industry's Door Step—

With the Mathieson plant at Niagara Falls as a central point, draw a circle with a radius of four hundred miles and you have marked the heart of Industrial America.

But strategic location at the crossroads of industry is just one of the facilities for service that Mathieson offers purchasers of industrial chemicals. From the Niagara Falls plant seven trunk line railroads keep Mathieson products moving smoothly and promptly—regardless of whether the demand is for quick shipments to meet an emergency, or for regular consignments to fill quantity contracts.

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LIQUID CHLORINE
BICARBONATE OF SODA
MODIFIED VIRGINIA SODA
SODA ASH
BLEACHING POWDER
ANHYDROUS AMMONIA
AQUA AMMONIA

The EAGLE-THISTLE trade mark is a widely recognized symbol of this service. In purchasing industrial chemicals it signifies utmost value in product and utmost efficiency in service.

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MATHIESON
Industrial
Chemicals

Works:
Niagara Falls, N. Y.
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Warehouse Stocks
at all
Distributing Centers

DEAL DIRECT WITH THE MANUFACTURER

For Over Three-Quarters of a Opening, Cleaning, and Picking

For Over Seventy-Five Years Our Kitson Shop has been manufacturing Opening, Cleaning and Picking Machinery Exclusively

PHYSICALLY the Kitson Plant and personnel are entirely separate from the rest of our shops; and their whole organization is given over to the study and development of the opening, cleaning, and picking of cotton.

The mills of this country are beginning to realize more than ever before that the Opening and Cleaning process is of vital importance in the spinning of yarn; and that it is one in which there is a great opportunity to lower costs.

The Saco-Lowell Shops Have Been The Leaders

of this country in developing improved methods of opening and cleaning cotton. Within the last three years we have put on the market a number of new machines, and at the same time have redesigned and added many important features to the old ones.

But it is not only the development of new machines that counts; it is engineering experience and practical knowledge of the subject that has enabled us to lower the costs of so many mills.

It Will Be Worth Your While

to let one of our Kitson engineers study your problems and show you how to get the most out of the equipment you now have, and how additional machinery, where necessary, will actually save you money.

Opening and Cleaning machinery is the lowest priced equipment in your mill, yet it is capable of paying you the largest return.

SACO-

Largest Manufacturers of

Main Office: 147 MILK STREET, BOSTON, MASS.

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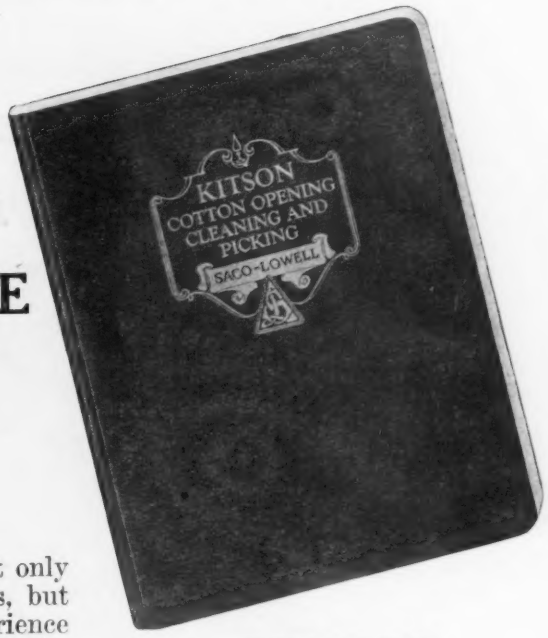
Century the Authority on Cotton in America!



OUR NEW CATALOGUE

of Kitson Machinery is a complete and exhaustive Reference Book on the whole subject of Cotton Opening, Cleaning, Blending and Picking.

THIS new catalogue takes up in detail not only the construction of the various machines, but also the conclusions formed from long experience which have led us to adopt our present advanced design of equipment.

Present day practices and theories and future trends on the preparatory processing of cotton are fully discussed. Authentic mill tests showing results and savings obtained from various combinations of equipment are reprinted in a number of cases, as well as the layouts of a number of mills running under varied conditions.

We are sure that you will find this catalogue not only an interesting but a useful book of reference, and a helpful guide in solving the problems of your Opening and Picking Department.

You need only to fill in and return the coupon to get your copy.

CONTENTS:

Opening and Cleaning Equipment
- Bale Breakers
- Tandem Feeders
- Lattice Openers and Cleaners (Single and tandem)
- Vertical Openers
- Horizontal Cleaners
- Dust Trunks
- Lattice Conveyors

Condensers

Automatic Conveyors and Regulators
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- Bin Distributor
- Double Auto. Distributor
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Pickers
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One Process Picking
Modernizing the Opening Room
Power and Production Tables
Typical Mill Layouts

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Textile Machinery in America

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Gentlemen: Please send me your new catalogue (K-1) on Cotton Opening Cleaning and Picking Equipment.

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Mill _____

Title _____

Address _____

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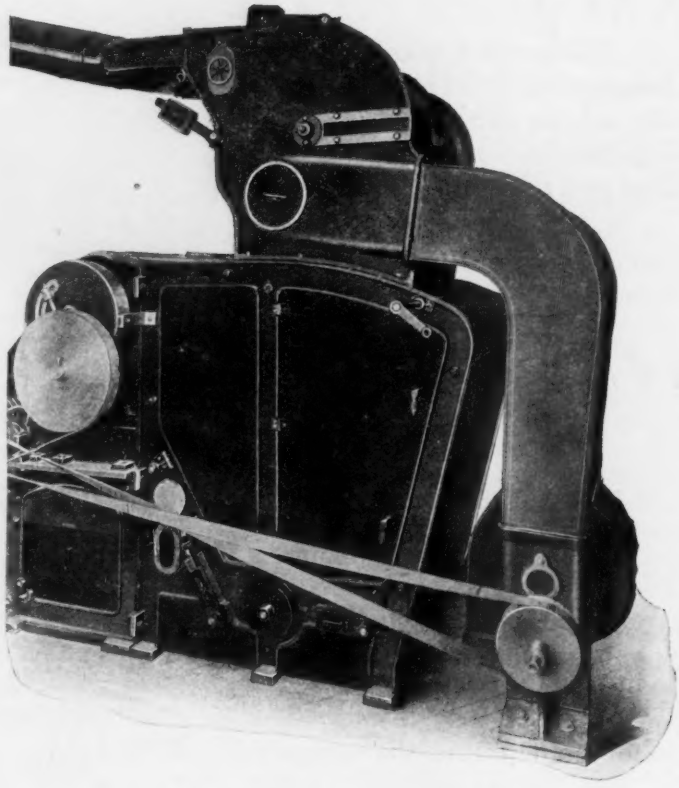
Southern Office, 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

OPENING, CLEANING AND PICKING MACHINERY



No. 3 Hopper Feeder with New Cage Exhauster

The equipments which we build conform to the most modern practice both in conception and production. In material, design, and workmanship nothing is left undone to ensure profitable efficiency in operation.

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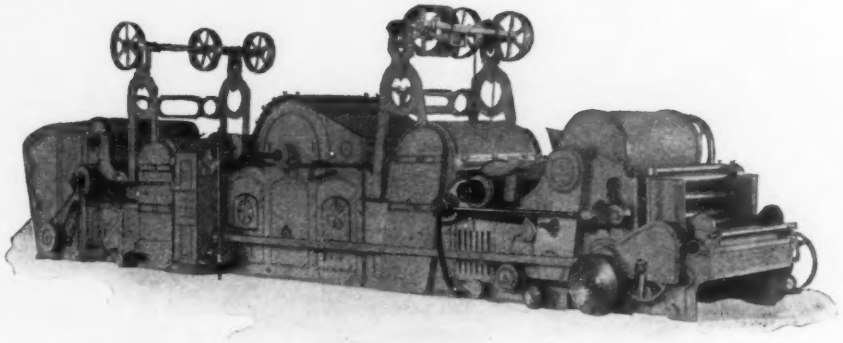
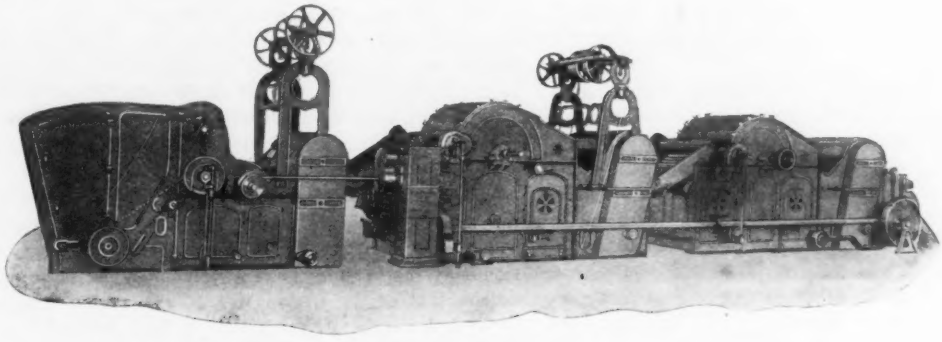
MAXIMUM CLEANING WITH MINIMUM BEATING



Combination No. 3 Feeder and Single Buckley Opener Breaker Lapper

Our BUCKLEY OPENER BREAKER LAPPERS have great cleaning power combined with gentle treatment of the cotton. Continuous gridded surfaces from cylinders to cages, full width feed, perfect regulation of weight.



Combination No. 3 Feeder and Double Buckley Opener Breaker Lapper

By employing more than one cylinder, it is possible to clean the lowest class of cotton upon the Buckley principle with a minimum of beating.

(*Continued from page* 246.)

There is lacking among manufacturers in New England any great desire to take concerted action in the matter of wages, largely because production has become widely diversified and help is none too plentiful. It is being stated by many manufacturers that if it is possible to put into effect some new plans for operating machinery, operatives can produce more while working for the same net wages per week. This theory of meeting the present situation is being voiced by manufacturers who have been successful in the past two years in installing new machinery and new methods of operation in various mills.

There is a wider recognition of the necessity for conserving in the New England industry all of the highly trained and skillful operatives essential in the profitable handling of fancy goods of many different fibers. The market situation is such that they believe that any wage reduction that might be accepted peaceably by the workers would be lost to the mills as a consequence of lower bidding by those who use the products. There is also a feeling that on many fine and fancy goods, the present time is a between-seasons period that may last until Spring and Summer reorders come forward more freely after the January retail sales.

The slackening of finished goods business has been manifested in several different ways. The last report of the National Association of Finishers of Cotton Fabrics on the monthly percentage of normal average capacity operated in the finishing industry showed that November output of white and dyed goods was only 65 per cent compared with 75 in October; on fast blacks 24 against 34; on logwood blacks 27 against 35; and on prints 74 in November compared with 91 per cent in October. These figures indicate very clearly that converters have not been moving their finished lines as freely as they were in September.

The large printers such as the American, Pacific, Winsdor, and Algonquin have had a varied amount of work in hand that has kept them pretty fully employed up to the present time but new business has fallen off and some of them do not look for any active renewal until after the turn of the year.

That the sheet and pillow case business has not been keeping up to expectations was shown by a curtailment of output in the Biddeford plant of the Pepperell Manufacturing Company of 25 per cent. The manufacturers of fine count wide sheetings did not follow the lead of price advances made by the manufacturers of low count goods. They still have orders in hand that are keeping their machines well occupied.

On the 10th of the month the Amoskeag Manufacturing Company announced prices on napped fabrics for the manufacturing trades for the Fall season of 1928. The price level was unchanged from the slightly higher levels reached during the year than those that prevailed at the opening of the season for 1927. At the new price levels manufacturing trades have begun to place business in a fairly satisfactory way.

The Amoskeag showed two new fabrics for the coming season. One, called Chamo-Twill is a fancy striped twilled cloth of good body with pure white ground especially adapted for night wear garments. They also showed a complete line of Duveteen, a fabric napped on one side and suitable for the shirting trade. They also showed a very heavy Duveteen which is a double napped fabric suitable for jackets and rough outer wear. New bleaching processes have been installed and the white now offered in the new lines is of an exceptionally brilliant character that will not change its color in any material degree. Deliveries on the new goods will run from March through July. Due to the closing of many napped goods mills in New England in the past year or two from 30,000 to 35,000 cases less are being produced here.

There was a large napped goods production in the Amoskeag and Nashua mills and a large production of blankets and fancy heavy weight napped goods in the Esmond of Rhode Island, Massachusetts division of the Pepperell and the Beacon Company at New Bedford. A number of the Maine mills have gone on to part wool and cotton blanket production.

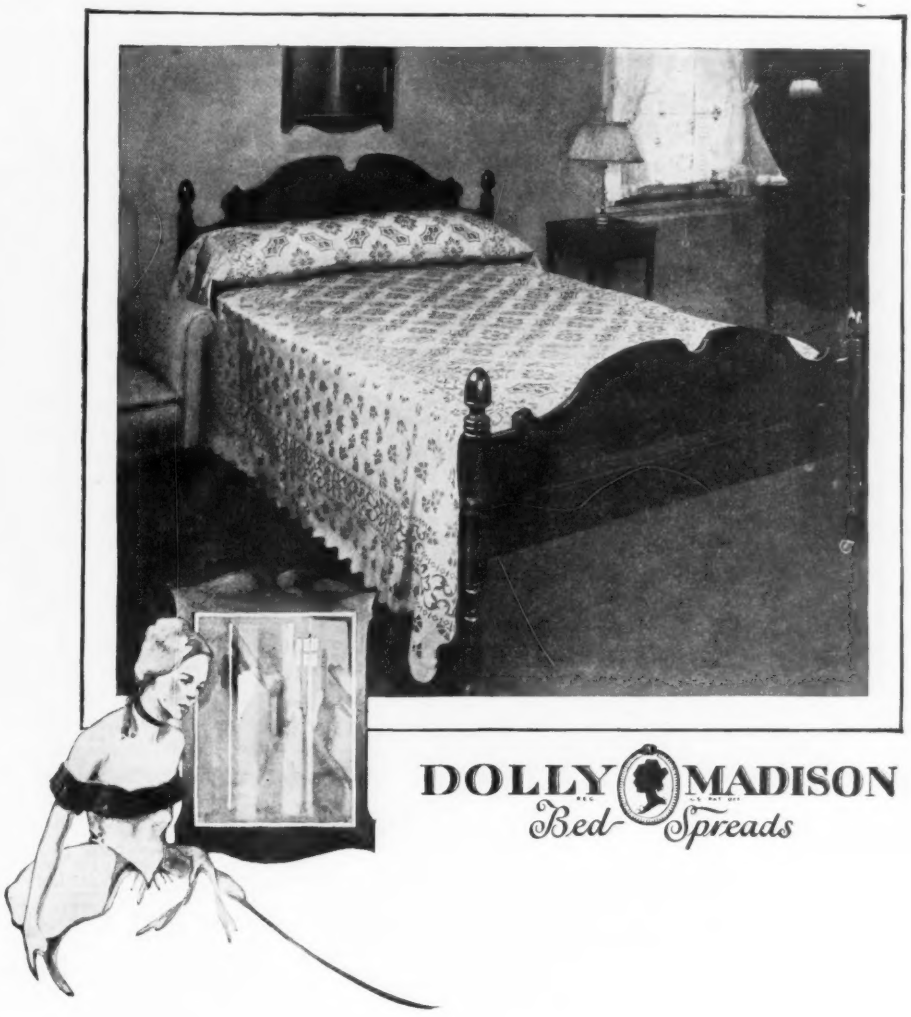
Fancy bedspread production has been overdone in some lines and competition has made the low end of the business most unprofitable. The proportion of all white bedspreads being made has become almost negligible in some plants. Rayon damasks are being made in many mills but the demand for them has not been steady of late.

There has been a falling off in the demand for sale yarns in combed yarn qualities. The mills engaged on aeroplane cloths and tire fabrics are well occupied but they are comparatively few in number. The volume of new business on fine broadcloths has been disappointing although the yardages still being shipped on past orders are quite large.

There is a marked tendency among mills using rayon to abandon the low count and lower grade quality. There is a larger demand for the finer sizes for dress fabric wear and for underwear purposes. The decision of the rayon producers to accept business at old prices for deliveries in February, March and April has not been followed by the placing of new orders as freely as those given last Fall when business was accepted for the last quarter of this year.

News from the machine shops shows that new business has been falling off steadily in the past month or two. There has been considerable business done during the past year on new carding and opening equipment to enable mills to use lower grade or shorter staple cotton more profitably. There is also considerable experimental work going on looking toward the adoption of more long draft spinning in the mills.

The work of reorganizing or liquidating various properties throughout New England is making steady progress. The Lyman plant at Holyoke was bought during the month by the Whiting Paper Company whose large plant adjoins that of the Lyman Mill. The Firestone interests are reequiping the Manomet Mills in New Bedford for the production of tire fabrics and will employ 2,000 operatives. The cotton mill plants of the American Printing Company at Fall River have been closed for an indefinite period, it being found cheaper to buy print cloths in the open markets than to produce them from high cotton in the Fall River plant. The Kingsport, Tenn., plant of the company is now operating profitably. The Granite Mills at Fall River have been reorganized by the payment of $200,000 in new capital by the stockholders and by the advance of another $200,000 by the local banks for quick capital.



DOLLY MADISON
Bed Spreads

GEORGE ROYLE & COMPANY, manufacturers of the famous "Dolly Madison" Bedspreads and fine upholstery fabrics, use Halton Jacquards *exclusively*.

They know that the uniformity of weave and the intricacies of their creations can best be handled on looms guided by Halton's Jacquards.

It is interesting to note that wherever Halton Jacquards are installed, their owners will accept no other—A tribute to the efficiency of a Halton.

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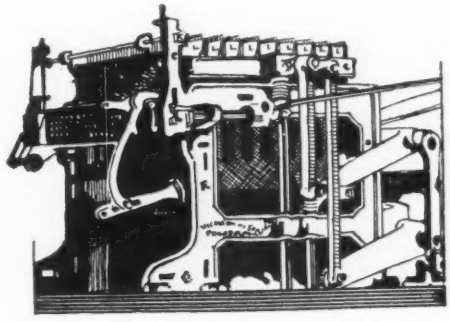

THOMAS HALTON'S SONS

Mascher St. Below Oxford

Philadelphia

"USE A HALTON JACQUARD AND YOU USE THE BEST"

The stockholders of the Osborn Mills are endeavoring to reorganize that plant which was placed in a receiver's hands a short time ago. The Pocasset Mill properties in Fall River have been denuded of machinery and the large buildings which occupy a prominent site in the center of the city are to be torn down and the granite block in them are to be used for foundations for a new bridge that is being built between the Island of Rhode Island and the mainland at Bristol Ferry, Bristol, R. I.

New England manufacturers are becoming more convinced than they were of the possibility of the Cotton-Textile Institute being able to bring about a regulation of production. Progress already made in meeting the situation in narrow sheeting mills and print cloth mills in the South by curtailing operations to avoid accumulating stocks is fully as great as might reasonably have been expected and it is believed that through cooperation the industry as a whole will not pass through another disastrous year as that of 1926.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, December 10th, 1927.

During the past month the market ruled rather irregular but with a downward tendency, values recently reaching a new low level since the early September peak. Of late the undertone has been somewhat better in consequence of the world's visible supply increasing slower than at this time one year ago, increasing during the past week only 26,000 bales vs. an increase of 214,000 for the corresponding week last year, having about reached its peak for the season—5,627,000 bales against 6,450,000 one year ago; it will likely begin to decrease shortly, whereas it continued to increase to near the close of January last season when it reached its peak of 6,870,000 bales.

The government, in its annual estimate of the season placed the indicated crop at 12,789,000 bales of 500 pounds gross weight compared with last year's production of 17,977,000 bales, a decrease of 5,188,000 bales, which is the smallest crop since 1923, of which 11,743,000 bales were ginned to December 1st against 14,644,000 bales ginned to the corresponding date last year, leaving only 1,046,000 bales to be ginned after December 1st vs. 3,333,000 ginned after December 1st of last season.

The action of the market the past several months, especially of late, has been very disappointing to Southern interests, particularly to the holders of spot cotton, due to spinners of the world buying from hand to mouth only, which is reflected in the small sales reported daily, in exports from the United States and spinners takings by the world running behind comparatives of last season; also because of unfavorable domestic trade advices and talk of increasing curtailment by American mills.

Compared with last season the South has marketed to date 8,825,000 bales vs. 11,219,000, exports from the United States have been 3,343,000 bales against 4,423,000, and spinners takings by the world have been 6,462,000 bales compared with 6,845,000.

Curtailment of exports, mill takings and production by spinners is only natural in view of the smallness of the crop, and there will have to be further important restrictions in shipments from the United States and in world spinners takings, which last season totaled, combined 19,463,000 bales, whereas the total season's supply for the United States, including last year's carry-over in America, this year's crop, linters, etc., exclusive of mill stocks, is only about 16,082,000 bales.

Today, compared with last year, exports from the United States and American spinners takings, combined, are 1,583,000 bales less, and even if the deficit compared with last season should increase to 3,381,000 bales, there would not be a bale left on this side of the Atlantic, exclusive of mill stocks, by the close of next July, as 3,381,000 deducted from 19,463,000 bales, which was the amount of American mill takings and exports last season, would make 16,082,000 bales, which is this season's indicated supply in America. In other words the United States cannot spare more than about 7,220,000 bales for American mills this season against 8,220,000 last year, and cannot spare more than 8,362,000 bales for exports vs. 11,243,000 last season, and retain about 500,000 bales, scattered in the interior and at the ports to protect the contract markets.

Meanwhile the excess in the European visible supply and afloat of American cotton, which was about 1,000,000 bales larger than last year at the opening of the season, has disappeared, now 70,000 smaller than one year ago, and as spinners have virtually been out of the market for the past two months, they will likely be obliged to reenter the market at an early date to provide for their future requirements, especially since the visible in the United States is 753,000 smaller than at this time last year and the fact that the South has yet to market about 3,194,000 bales less than was on hand in the interior on even date one year ago—7,257,000 bales against 10,451,000.

WORLD'S AVAILABLE SUPPLY OF AMERICAN COTTON DECEMBER 9th, EXCLUSIVE OF MILL STOCKS.

Bales—	This Year	Last Year
Visible in the United States	3,309,000	4,062,000
European visible and afloat	2,318,000	2,388,000
World's visible supply	5,627,000	6,450,000
Remaining to be marketed, estimated	7,257,000	10,451,000
World's available	12,884,000	16,901,000

While world's consumption is expected to fall off from now on, it has undoubtedly been much larger for the first four months of the season than for the same time last season. This we know to be a fact so far as the United States is concerned where consumption of lint cotton for three months, to the close of October, was 1,874,000 bales vs. 1,639,000 for the corresponding period last season. With such a small crop to contend with, and with much higher prices than last year, no one could hardly have expected consumption to be as big as it was last season when it was, according to Secretary Hester, 17,428,000 bales including linters.

Jacobs to Expand Charlotte Plant.

E. H. Jacobs Manufacturing Co., of Charlotte, N. C., and Danielson, Conn., which began manufacturing operations in Charlotte early last year, announce they have taken over another floor in the Bostic Building on West Palmer Street for doubling manufacturing operations and permitting of a more efficient arrangement of production and distribution of their textile loom accessories.

E. C. Beard, formerly New York sales manager of the Beacon Falls Rubber Shoe Company, Beacon Falls, Conn., has been appointed southern sales manager, with headquarters in Charlotte. H. S. Lowndes will continue in charge of manufacturing operations.

"THERE IS A TEXACO LUBRICANT FOR EVERY PURPOSE"

The same care in refining, the same scrupulous attention to quality which have earned for TEXACO Motor Oil the reputation for being the finest automotive lubricant in the world, are used in the manufacture of every industrial lubricant made by

TEXACO

THE TEXAS COMPANY

Texaco Petroleum Products

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OFFICES IN PRINCIPAL CITIES

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

T. B. SPENCER has been made president and treasurer of the Cascade Mills, Mooresville, N. C. Mr. Spencer is a graduate of Clemson College, S. C., Class of 1902, and it is interesting to note the positions of several other members of this class. David Jennings is a director in the firm of J. P. Stevens & Company; J. E. Gettys is vice-president and manager of the Victoria Cotton Mills, Rock Hill, S. C.; David Kohn is secretary-treasurer of the Edisto Mills, Greenville, S. C.; and J. H. Spencer is manager of the Barber-Colman Company, Greenville, S. C. The late Henry B. Jennings was president of the Union-Buffalo Mills Co., Union, S. C.

WILLIAM A. ANTHIES has been appointed superintendent of the newly organized Piedmont Plush Mills, Greenville, S. C.

VAN COURT CARWITHEN, head of the cotton yarn house of that name, Philadelphia, Pa., died suddenly on November 13th. He was sole Philadelphia sales representative for the Swift Spinning Mills, Muscogee Mfg. Co., and Bradley Mfg. Co., Columbus, Ga.

H. B. CHILDERS, formerly second hand in weaving at the Victor plant of the Victor-Monaghan Co., Greer, S. C., is now overseer of weaving at the Franklin Cotton Mills, Greer.

WILLIAM BYRON RUFE, secretary of Jenkins Brothers, New York City, and Jenkins Brothers, Limited, the Canadian branch of the concern, died in Brooklyn, N. Y., on November 27th. He began with Jenkins Brothers as their first stenographer, and became secretary in 1907. In January 1928 he would have completed 40 years of service. He was 56 years of age.

J. R. FEDERLINE, for some time overseer of spinning at the Darlington Mfg. Co., Darlington, S. C., has become general overseer of spinning, spooling and warping at the Lanett Mill Division, West Point Manufacturing Company, Lanett, Ala.

J. R. SULLIVAN, JR., has been made treasurer and general manager of the Texas Hosiery Mills, Dallas, Texas.

J. C. EDWARDS, formerly overseer of spinning at the Anchor Duck Mills, Rome, Ga., has been made superintendent of the Martha Mills, Thomaston, Ga.

W. F. PETTIT has become overseer of spinning at the Darlington Mfg. Co., Darlington, S. C.

L. L. BAMBERGER has been made resident manager of the U. S. Finishing Company, Cedartown, Ga., succeeding Paul A. Merriam, who has been made chief engineer of the company's entire properties with headquarters in Providence, R. I. Mr. Bamberger has been superintendent of the Cedartown plant.

JAMES OATES has become overseer of spinning, spooling and warping at the Adams Duck Mills, Macon, Ga. He has recently been general overseer of carding at Thomas Henry & Sons, Nashville, Tenn.

J. T. HENDERSON is now superintendent of the Opelika Mfg. Co., Opelika, Ala.

D. C. FINNEY, treasurer, has been made president of the Barrow County Cotton Mills, with plants at Winder and Lawrenceville, Ga.

GEORGE ARCHER has been made superintendent of the Crawford Cotton Mills, Crawford, Ga.

C. S. STEEL has succeeded E. W. Fuller as superintendent of the Cranford Hosiery Mills, Asheboro, N. C.

J. H. DAVIS has resigned as night superintendent of the Lydia Mills, Clinton, S. C.

C. K. TAYLOR is superintendent of the Roundtree Mills, at Magnolia, Miss., and S. E. Ervin is superintendent of the company's plant at Meridian, Miss.

F. B. WATSON, who has been superintendent of the Martha Mills, Thomaston, Ga., has been made assistant general superintendent of the Bedaux system in the Thomaston plants.

S. M. ROBINSON is president, and C. B. Phillips, treasurer, of the newly formed Burlington Processing Company, Burlington, N. C.

ROBERT JACKSON is superintendent of the National Weaving Company, formerly the Art Cloth Mills, Lowell, N. C.

J. D. WHITMIRE has become overseer of carding at the Mills Mill, Greenville, S. C. He formerly held a similar position at the Brandon Mills, Greenville.

WILLIAM GREENWOOD has become superintendent of the Acworth Mills, Acworth, Ga.

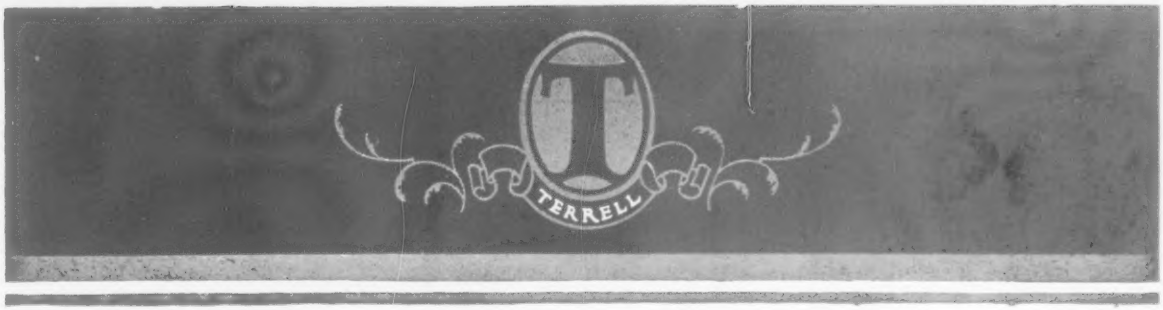
C. M. STEWART recently became overseer of carding at the Rodman-Heath Cotton Mills, Waxhaw, N. C.

J. L. JENNINGS has recently been appointed assistant superintendent of Fairfax Mill of the West Point Mfg. Company, Fairfax, Ala. F. R. Piper is assistant superintendent of bleaching and finishing at this plant.

J. P. RICKMAN, of Greenville, S. C., and Chattanooga, Tenn., has recently joined the sales organization of Standard-Coosa-Thatcher Company, mercerized yarn manufacturers. He will make his headquarters in the general offices of the company at Chattanooga, Tenn. Mr. Rickman has been in Chattanooga, handling sales for the Central Franklin Process Company for about fourteen months. Prior to that time he made his home in Greenville, where he was connected with the Southern Franklin Process Company. In his new connection he will handle all customer relationship in Georgia, Alabama, Louisiana, Texas, Kentucky, Mississippi and Missouri.

A. F. MACINTYRE, agent of the Appleton Manufacturing Company, Anderson, S. C., was presented with a beautiful escritoire and radio table of walnut, as a Christmas remembrance from the overseers of the organization.

E. J. BOSWELL has resigned as overseer of spinning at the Elberton (Ga.) Cotton Mills, to accept a similar position at the Whitehall (Ga.) Yarn Mills. He is succeeded at Elberton by C. C. Boswell, formerly second hand.



From the standpoint of economy alone, Termaco Bobbin Cleaners are essential to efficient, low-cost mill production.

Any machine which will save from 130% to 314% of its own cost *every year* can scarcely be regarded other than as essential equipment. This is the Termaco record, according to outside, impartial investigations.

A Termaco cleans bobbins faster . . . better . . . without waste . . . more economically. Cleans upward of 30,000 bobbins a day—perfectly, without damaging or marking.

Accurate figures on the savings Termacos will effect in your own mill, gladly prepared upon request.

The TERRELL MACHINE CO. Inc.
Mfrs. Termaco, Utsman, Type K, Etc. Machines
CHARLOTTE, N.C.

General Supply Co. Danielson, Conn.
N.Y. and N.E. Representative.

How Would You Like to Run Your Mill and Stop Buying Altogether?

IF everything you bought was like U S Fibre Head Spools, you could do it. Ask the man who runs them. He is "Out of the market."

Why did he buy them? He likes them and "They last longer." Perhaps he won't take the time to enumerate the advantages of Fibre Head Spools—it's a long list. Maybe he won't tell you that he and every man in the mill is proud of them, but it's a fact. They look good in your spooling rooms, and are a sign of progressive development in your mill.

U S special construction with tenons at barrel ends, coupled with dogwood beveled bushings, has set the standard for durability. Its additional strength has been proven by machine test and years of practical use.

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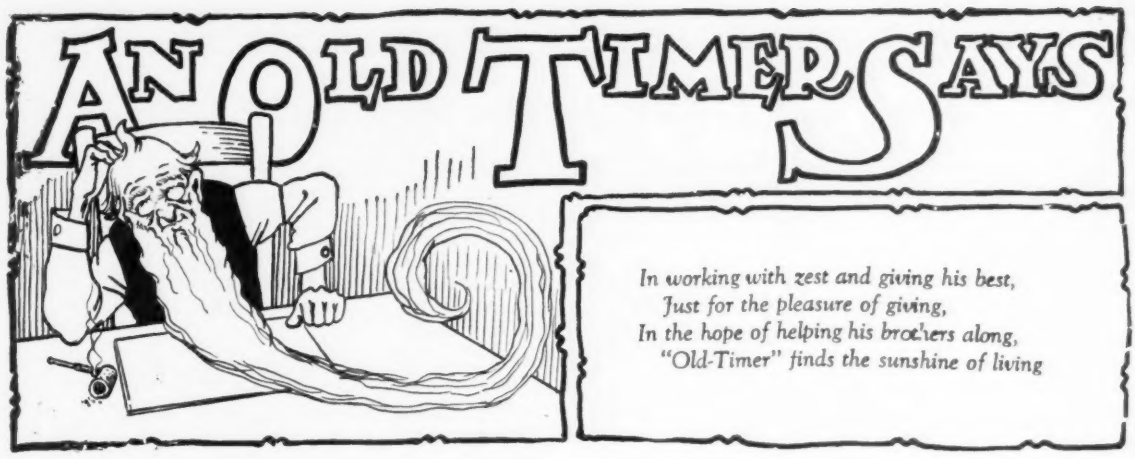
AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

Everyone can spend money. Most people can make money. Darn few can save money. How about you?

The difference between the prosperous man and the poor man is largely a difference in willingness or ability to save. It is a strange fact that the very large majority of prosperous or wealthy men are those that had practically nothing to start with.

There are only a few men who have done what we call "big things," that started off by having a large fortune left to them.

These facts should be very encouraging to those of us who are classed as poor because it is from the poor men that most rich men come.

Strange to say, this same reasoning applies to men in their positions in practically every vocation of life. Just how many superintendents or overseers do you know who did not come up from plain operatives and section men. They are just about as scarce as hen's teeth, aren't they?

Then can't you see that if you have been fortunate enough to be promoted to overseer or superintendent that there is no need of your standing still. You can be a bigger overseer or superintendent because there is nothing else to make bigger overseers or superintendents out of.

Had you ever thought about it that way?

Or are you just drifting along on the job day after day expecting that some one will come along and grab you for that bigger job. Well, it does happen that way sometimes —in story books.

But the man who is doing his very best to improve his job—using supplies like he was paying out his own money for them—keeping abreast of the times by reading and studying everything he can get hold of pertaining to textiles—working every scheme he can devise to get more product per machine and especially more product per operative—

Well, that fellow is just so dog-gone busy he hasn't time to see that bigger job coming, and it has "grabbed" him and gone before he realizes it.

No story book about such a case as that; it is just plain facts.

Remember that long article "Old Timer" gave you about selling yourself, or words to that effect? It is just the same law that causes water to run down hill.

Don't you pay more money for a Cadillac than you do for a flivver?

Don't you pay more for a good cigar than you do for an "Old Virginia Cheroot?"

Don't you pay more for a Stetson hat than you do for a shoddy one?

Oh, the devil! Can't you see that a good overseer or superintendent will bring more than a sorry one? (The word "good" is, of course, used in the sense of more efficient).

Isn't that about the most simple reasoning you ever had put to you?

There is simply no possible way for you not to understand it.

Then if you don't step on the gas and try to show your firm that you are above the average—I say if you don't, I guess you are just too darn lazy.

• • •

Study the men above you—then add your own brains, and you should be able to become more of a success than they are.

• • •

Life is too darn short to learn entirely by one's own experiences.

• • •

The trouble is, very few men know how to derive the benefit from other people's experiences.

• • •

For example, I had an operative who was absolutely no good— he simply did everything which was mean and contemptible. I had him on the loafing list. A new overseer took charge of that room. Here came the loafer to apply for work. I told the overseer what kind of fellow he was, but did not refuse to let him hire the fellow.

A few weeks ago I saw the fellow loafing around again and I asked the overseer if he had quit. "Hell no; I fired him. That fellow gave me more trouble than all the other help put together, etc., etc."

But that overseer could not profit by my experience.

• • •

Put your job above everything that concerns you personally.

• • •

Read and study everything you can get your hands on that in any way pertains to Textiles.

• • •

When a man realizes he can practically make himself over by a systematic line of study, he will have opened the door to a bigger job.

Those Old TITANS Who Wanted Facts

Every now and then, the picture of some industrial giant or financial genius of twenty-five or thirty years ago, appears in a current magazine.

No matter who the old gentleman may be, he is apt to be credited with having said, "I want the *facts*." And to any one familiar with the biographies of some of these grand old men, it is hardly questionable that they *did* want the facts and said so.

They hungered for facts, these old Titans—facts on trade conditions, on markets, materials, processes, inventories, costs, organization, sales—facts on the wastes in their business, leaks and mistakes. That facts were obscure and hard to get in their day only stimulated their desire for exact knowledge. They searched and *dug* for facts, and on them visioned the future and laid the plans for their great achievements.

All progressive business, striving to attain larger reward and new heights in human service, has for its slogan, *Facts*. And Modern Accountancy stresses the *necessity* for facts, timely, dependable, properly interpreted—and has made them, to a large extent, readily available.

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Desires a Remedy for Static.

EDITOR COTTON:

Recently we have started to run dyed stock, and have succeeded very well, except I have had only my ordinary machinery and could not spray it as it should have been. It has bothered us on the railways and drawings by not coiling up properly, due no doubt to static.

What can be done to stop this? Could you give me the mixture of salt solution which is sprayed on the laps in the picker room. E. D. (N. H.)

Bleaching a Blue-Grey Sheeting.

EDITOR COTTON:

In the October issue you published an inquiry from a subscriber who desired suggestions as to a method and formula for securing a pure white finish on a 2.85 yard sheeting, a sample of which was submitted to me. The stock used in this goods was very deeply stained, and for that reason I believe that two boils would be essential for best results.

The cloth should be thoroughly wet down before entering the kier and, if possible, it would be much better to steep it over night before giving the first boil. If the layout however, does not permit of steeping, the cloth can be saturated, putting through a washing or wetting down machine and run directly into the kier, letting it boil at least six hours. For the charge in this first boil, I would use: 90 pounds of caustic soda and 110 pounds of soda ash (but no soap) to each 4½ tons of goods. Boil with a pressure of approximately 23 pounds or 248 degrees temperature. After the first boil the cloth should be pulled out, thoroughly washed and soured with sulphure acid at one degree twaddle; thoroughly wash again and run into the kier for the second boil. The kier charge on this boil I should say, should consist of: 120 pounds of soda ash, 57 pounds of caustic soda and 40 pounds of soap. Boil for six hours.

The cloth should then be pulled from the kier, washed and chemicked from 3/4 to 2 degrees twaddle and run into a bin where it should lie for about three hours. It should then be picked up and soured in sulphuric acid ¾ to 1½ degrees twaddle, and then given at least two very thorough washings.

I believe that the foregoing will produce excellent results, giving a clear and a permanent white. As to the finish, we of course do not know exactly what results are desired, but would suggest that the following be given a trial, and from the results obtained it can be determined whether or not to vary the formula, and if so, in what direction:

For 220 gallons—corn starch 150 pounds, potato starch 22 pounds, dextrin 55 pounds, tale 20 pounds, softener 20 pounds, salicylic acid 12 ounces, acetic acid 9 ounces, blueing 15½ ounces.

It might be that by steeping this cloth and prescouring, the desired results in the way of a bleach may be obtained with one boil, but as stated, due to the stained stock which is being used, two boils seem to me to be essential. I stated that the kier should be boiled for six hours. I mean by this, of course, that the kier should be kept at the boiling point for this long and the steam then cut off, but the goods should remain in the kier for about twelve hours.

I trust that this may be of some benefit to your good subscriber.

CONTRIBUTOR NO. 520.

What is the Life of a Quill?

EDITOR COTTON:

The question of "W. E. (S. C.)" in the October issue of COTTON asked for information as to the life of a quill or filling bobbin in looms running between 156 and 164 picks. He states that his looms are automatic but does not state the make. He says the life of a quill is determined by two factors. First, the several trips between the spinning and the weaving and second the speed of the loom. He also says the make of the loom is a great factor.

I am not going to state the number of bobbins he will have broken and worn out in 500 looms in the course of a year, for I do not know. I have never had a room of his makeup. He states that most of his bobbins are broken at the loom battery. I may say that the speed of the loom does not make a great deal of difference if not higher than 164 picks, but I will say that the battery does make a lot of difference. As I don't want to make this letter an advertisement I shall not mention the different makes of batteries, but there are some on the market that in my opinion, should have been junked before they were ever put on the loom.

Now if "W. E." has the right make of battery, his breakage at the loom, if the battery is set correctly, should not cost him much worry. One main thing about setting a battery is to have some good make of check on the shuttle so that when the shuttle is delivered in the battery end box it will not rebound, but will stay where it is placed.

He should first start in and set the battery, and then see that the shuttle feeler is in the correct position so the bobbin will not be transferred unless the shuttle is in the

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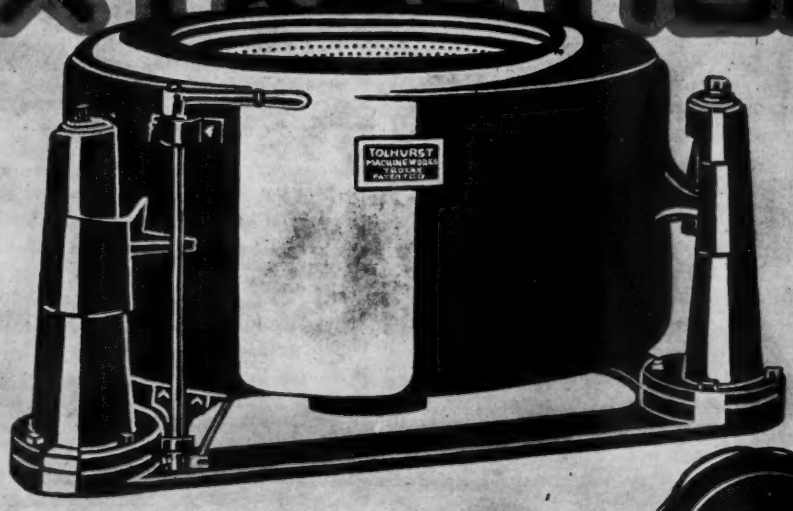

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right position in the box—that is, full against the picker when full back. He should transfer a bobbin to the shuttle, see that the bobbin transferrer comes in contact with the empty bobbin one ring behind, and when the lay is full ahead, the transferrer should be about 1/8 inch from being in contact with the bobbin transferred, if the loom is running at 164 picks; closer if the loom is running slower.

Now as to the bobbins being broken on the floor by trucks, that is due to carelessness, which if looked after should be almost eliminated. Loose shuttle springs will cause breakage of bobbins at the transferrer.

P. T. S. (ME.)

EDITOR COTTON:

In reply to "W. E. (S. C.)" in regard to the life of filling quills will say, we make English broadcloths and run about 160 picks per minute on 42s filling yarn. We buy from 5,000 to 10,000 quills per year as a total varying according to the number of extra quills that we have on hand. We have about 500 looms on day run. I think that a quill should average a life of three years. We find the greatest breakage in the quill skinner and the battery.

W. J. (N. C.)

Wants a System for Numbering Looms.

EDITOR COTTON:

I would be very pleased to see a discussion in the "How Other Men Manage" department on methods of numbering looms. We have here rows of looms from 3/4 to 10/4 widths, and the experience of others in numbering such an assortment would be very helpful.

CONTRIBUTOR NO. 3023.

Wavy Places in Weaving Sheetings.

EDITOR COTTON:

Referring to the letter of "S. A. E. (N. C.)" in July COTTON, in which he says: "We are having trouble, in our sheeting, with a wavy appearance. The weave is irregular and is nothing like as smooth and even as it should be. The weave has the appearance in places of small drawbacks."

"S. A. E." further states that the trouble is not due to uneven let-off at the loom, and that if the harness settings accounted for the defect, they had, so far, been unable to remedy it.

The sample of sheeting sent along with "S. A. E.'s" letter shows numerous short, wavy appearing places in the filling, and the warp yarn, at these wavy places, often shows a slightly puckered, or cockled, condition. It appears, from examination of the sample, that the trouble is due to uneven tension on sections of the warp yarn. The following suggestions as to the cause of this uneven tension are offered:

(1) Uneven tension on section beams at the slasher. This may be caused by "dead-weighting" certain section beams in the set, and not using weights on the other beams. It may be caused by a crooked section beam spindle that causes a heavy pull on one half turn of the beam, followed by a slacking up on the other side. This uneven tension takes the elasticity out of the ends of the beam affected, and when these ends are being woven into the goods, they do not give as much as ends from section beams that have not been over-stretched. The ends with normal elasticity, and those with the elasticity taken out, do not take up evenly in weaving, and the wavy lengths of filling follow.

(2) Extreme unevenness of the filling. When held up to the light, and when examined over the electric lights under ground glass, the filling is seen to be very uneven. Where a number of thick places in the filling happen to come one behind the other, the reed will be forcing the few ends affected much harder than the other ends to right and left of them, and will stretch these few ends. This is then followed by normal, or thin filling, and these few ends cease to receive the brunt of the shock from the reed, and cease to be stretched. They will then take up faster than the ends to right and left, that have not been stretched, and will tend to cockle or pucker slightly. Other ends will constantly be accumulating thick places, followed by normal filling, and will, in their turn, be stretched, and then allowed to run for a space without being stretched. This more or less constant stretching and slacking off of section ends may account for the short, wavy lengths of filling scattered over the face of the goods.

The foregoing opinion as to the cause of the trouble was agreed to by several experienced weavers. One, however, stated it as his belief that the trouble was caused by the twisting of the rope of sheeting as it was being handled in the bleaching process. Since the writer has not seen a piece of the goods just from the loom, in the gray, it is impossible to know whether or not the trouble arose after being woven. It appears, however, that the unevenness, or waviness, was caused by conditions explained in the foregoing.

J. W. C. (TENN.)

EDITOR COTTON:

The cause of wavy weave in sheetings is requested by "S. A. E. (N. C.)," who says that he has already checked up on his let-off and harness settings and does not believe these to be the trouble.

He might take a good look as his warper beams while they are running on the slasher and see if they are true both in respect to barrel and heads. If they are "out" they should be sent to the shop and trued up by turning down on a lathe and packing the heads to see that they are true. Uneven let-off on the warper beams is due to this eccentricity of heads and beams so that certain threads in the warp have more tension on them than others, and when the cloth is woven up and finished, it pulls the filling out of place. This is the first place I would look for this kind of trouble. I would also see that the beams from the slasher are packed good and tight and are not too soft.

J. R. W. (N. C.)

EDITOR COTTON:

It seems that the sheeting of "S. A. E." is irregular and wavy in appearance, and he asked in a recent issue what might cause it, since he had checked over the harness settings and let-off and found this was not the trouble.

I had the same trouble once and will tell what helped me. It seems from an examination of his sample that the difficulty was about the same. I suggest that he count in the yarn into the combs both back and front of the slasher, so as to run the loom beams full of yarn free from ridges, as these will cause uneven tension on the warp. Also, I would set the loom harness and warp tension so there will

be no "face" on the cloth. The cloth is bleached so both sides are "face." I also suspect he is using a new type of shuttle eye, that came on the market in the last year or so, which allows the filling to become slack in the "shed" before it is beaten up. This particular type of shuttle eye and filling friction is so constructed that it exerts tension on the filling only while the shuttle is moving. Therefore, when it stops in the box on each pick, the tension is released and the filling becomes slack in the shed. I have found the standard type shuttle with the flannel friction the best for a sheeting weave.

I also notice much unevenness in the filling in the sample. The thick places emphasize the "waviness" fillingwise in the cloth.

Also, if his looms have two beams, I would see whether the beam shaft or differential gears on the let-off are binding.

The foregoing helped me on the same problem once. I hope it helps him. P. A. X. (N. C.)

Why Do the Selvage Ends Twist?

EDITOR COTTON:

We are having trouble with the two outside ends of our selvage twisting, causing a very bad selvage. We do not know what is causing these ends to twist. If we take these two ends out the next two will commence to twist, they then being the outside ends. If we break out one end the selvage will be all right, but we want to put these two ends in. We are on regular sheetings and put 16 ends in the selvage, reeding them four in a dent. If some of your readers can tell us what is causing the twist in these outside ends we shall appreciate it very much.

CONTRIBUTOR NO. 3024.

Warp Tyers to Aid Loom Fixers.

EDITOR COTTON:

On 30-inch and 36-inch looms on print goods and sheetings with 30s warp, 5.00- to 5.50-yard, how many looms should a fixer be able to look after if he is assisted by a warp tyer who takes off the old warp and puts in the new one, and how many looms should a warp tyer attend, his job being to take off the old warp, make the pattern to be sent to the tying-in department, and put the new warp in the loom ready to start?

These questions are asked by "M. E. (S. C.)" in a recent issue of COTTON. There are so many things that enter into these two kinds of work that I doubt if you would want to give space for such a lengthy answer. However, assuming that they do not have any tape selvages or feelers to bother with, as he says it is print cloths and sheetings, 5.00 to 5.50-yard, I assume that he is on something like a 38½-inch, 64x60, 5.35-yard, or a 38½-inch, 64x56, 5.50-yard goods. I should say a good loom fixer on these could keep in operation about 200 looms, provided he is supplied with a good quality of the necessary supplies.

In regard to the warp hand, a man who is skillful can take off a pattern and put in a new warp and start it up on an average in 30 minutes each on plain sheeting or prints, and on the class of goods mentioned, a loom beam will hold about 24 cuts each of 63 yards, or around 1,500 yards, the production on these goods, if the loom is running at 160 picks per minute on 64x60, is about 44 yards a day of ten hours. 1,500 yards divided by 44 equals 34 days a full beam will run on a loom. Therefore, you will see that he will have to tie-in or put on the loom a new warp about every 34 work days, or less than three beams a day to every 100 looms, and at that a man could take care of 500 looms a day.

Now, this looks very good on paper, but it is not practical. If so, we would have been doing this long ago. Very few men, outside of those next to the job, know how weather conditions and other things enter into the regular operation of cotton mill machinery. Under normal conditions, as stated in the beginning, a good loom fixer can keep 200 looms going on prints, provided that he has all good weavers, that he has regular power, and that the weather is normal, and even at that there will be days in which he will have very little to do, and again it will run him almost to death to keep his flags down.

The warp man will have even more variations to deal with, in that it is impossible to keep the warps from running out by bunches. For instance, I was talking with one of our loom fixers the other day, who warps and keeps in repair 100 40-inch looms, and he said, "I had twenty warps run out today and I am worn to a frazzle." I said, "Well, did you get them on?" "Oh, yes," he answered, "but I had practically no beams out of order or I couldn't have done it." So you see, this man had one-fifth of the warps on his section run out in one day. What would have happened to a warp hand who was trying to warp some 300 to 500 looms? And then, too, any man who keeps up his machinery, when a warp runs off, should have the loom thoroughly cleaned and the lint and dirt picked out of all the oil holes, and the loom fixer inspect all movable parts while the loom is empty to see there are no worn parts that will give trouble during the life of the next warp.

So my suggestion to "M. E." is that he will do well to give a fixer what looms he can keep in operation doing his own warping, and having subject to his call a good cleaner and oiler.

There are many other objectional points I could comment upon, but I trust the foregoing will serve to show how impractical it is to operate on such a principle.

B. A. W. (S. C.)

EDITOR COTTON:

This is in answer to "M. E.," who wants to know how many looms a fixer should be able to look after, with a warp tyer, and how many the warp tyer should attend, on print cloths and sheetings.

In my opinion, on the goods he specifies, the fixer should look after 100 to 130 looms where he does not have to do any work on putting in new warps. A warp hand should run 225 to 275 looms. Both of these answers depend upon the size of the loom beam which regulates the amount of yarn on the beam and also the picks per inch which regulates the number of days it takes the warp to run out.

B. C. (S. C.)

EDITOR COTTON:

With reference to the question of "M. E. (S. C.)," who asked how many looms a fixer should be able to look after if he is assisted by a warp tyer who takes off the old warp and puts on the new warp and how many looms a warp tyer should attend, taking off the old warp, making the pattern to be sent to the tying-in department

and putting in the new warp.

I have never had such an arrangement in my mill, but should we undertake to do our fixing and warp tying in this manner I believe it would be based on 150 looms for the fixer, with an equal number for the warp tyer, on print goods. M. M. (S. C.)

EDITOR COTTON:

I am writing to discuss the question of "M. E. (S. C.)" with reference to the use of warp tyers for assisting loom fixers by taking off old warps and putting new ones on looms.

On the basis of my observation and experience, I think it is best for the loom fixer to tie on his own warps on sets of 90 to 100 36-inch looms making 164 picks per minute on 5.00-yard print cloth, rather than be assisted by a warp tyer. When the pattern is first taken off the loom, the fixer has a chance to thoroughly look over the loom for such things as loose sand roller fillet, worn out stop motion bushings, loose caps on cam shaft boxes, etc. Whereas, the man who does nothing but tie on warps would be very apt to neglect such things, consequently the loom would not be kept in as perfect running condition.

When a new warp is tied on the loom, the most important thing to do is to set the harness. The man working with the loom should set the harness because this must be done absolutely right. If a warp tyer should set the harness the chances are that he would not do it exactly right, and this of course would cause bad weaving. On the other hand, if the warp tyer is to be an experienced loom fixer, then of course he could set the harness, etc., but what advantage would this be?

I find it best to have the fixers work first on the looms that are "flagged," and then tie on warps after all other looms are running again. Oftentimes a fixer can take down several flags in a few minutes and get those looms running and then tie on the new warps, while if he were to tie on the warps first he would have several looms standing for a longer period of time. If, when having a large "run-out" a warp tyer is used, there would be a large loss of production on account of looms standing waiting for warp. If the fixers have to tie on the warps they will have only a portion of the "run-out" to take care of and therefore get the looms started more quickly.

From a cost standpoint, if the warp tyer is paid as much as a fixer—and he would have to be if he could do the things that have been mentioned—it would not be economy to have him. We find it best to let the loom fixer be responsible for setting and adjusting all parts of the loom and tie on his own warps. H. E. R. (S. C.)

EDITOR COTTON:

This replies to the questions of "M. E. (S. C.)" as published in the August issue regarding how many looms a man can keep in repair doing the fixing only, and also how many looms a man can keep up taking off the empty warp, making the pattern and also putting on a new warp and starting it up. He specifies that his questions apply to 36- and 40-inch looms on print cloth and sheetings.

When I was a loom fixer, before becoming overseer and later superintendent, I found that the kind of cloth woven has a great deal to do with the amount of repair work on a loom. As "M. E." is asking about prints and sheeting, it is my opinion, based on past experience, that the loom

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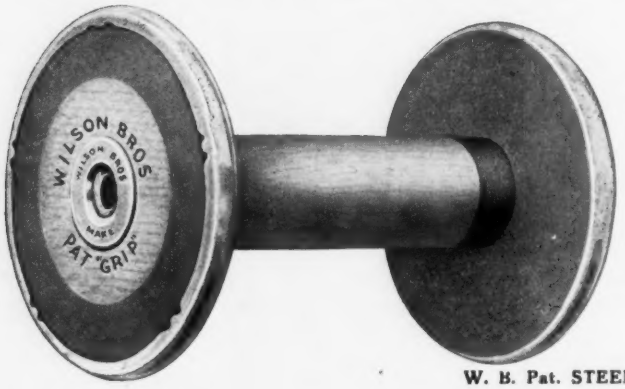

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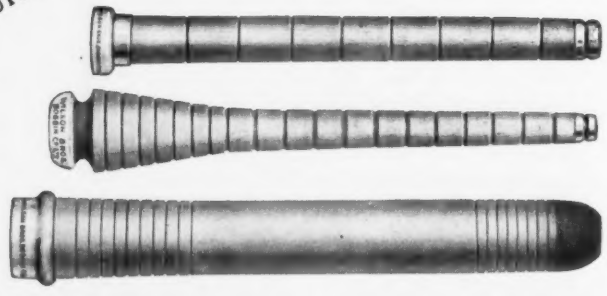

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fixer would be able to keep in repair from 200 to 250 looms.

The variation in the number he could keep up would be determined by the number of the filling and the count of the sley and the pick, as we know that the coarser the filling the more times the loom will transfer and the more it transfers the more repair work there will be; and also, the higher the count of the sley and the pick the more strain there will be on the loom and therefore the more repair work.

Regarding the amount of looms per man taking off empty beams, making patterns and putting on new warps and starting them up, I think that any average man with experience can do all the work necessary to take off and put on a warp in forty minutes time. Therefore it will depend on how many days a warp will run on a loom as to how many looms one man can look after. My opinion is that it will vary from 240 to 450 looms. P. C. (S. C.)

EDITOR COTTON:

In reference to the question asked by "M. E. (S. C.)" in the "How Other Men Manage" section of the August number of COTTON on the subject of using warp tyers with loom fixers, will say that is all a matter of local conditions and advantages of the fixer, to the slasher room where the warps are to be taken from and the time required to do such. It's a poor fixer who cannot carry his warps and keep his looms in mechanical condition on 90 to 100 looms, using a smash hand, as they are commonly called, to straighten up and regulate the pattern when the loom fixer has tied on the warp behind the loom and to adjust the mechanism of the looms, providing the slasher room is within a reasonable distance of the weaving room.

We have one smash hand to about 500 looms to do this work and to pick out bad places in the cloth as it appears from time to time, to relieve the regular weavers from such work and allow them to look after more looms. Then too, we figure that a loom fixer's time is worth more than a weaver's or a smash hand's time.

We have the looms cleaned and oiled under the supervision of the assistant overseer when the warp runs out. We have all of the oil holes cleaned out and oiled with a non-fluid oil, one that will stay put for the longest possible time before the oiler has to re-oil, and in connection with this, the non-fluid oil has less flow, or fly, to stain the cloth, and all goes to make up less work for everyone concerned, from there to the finishing plant. There are several brands of non-fluid oil and the different mills can select the brand to which they are partial.

Also, the writer has had many problems to solve, and in his judgment, the best solution of the matter is for him to follow, or have someone in whom he has confidence, to follow those fellows and learn from actual experience just how much time is required to do the different things connected with the subject in question. That is, taking it from the actual conditions as they exist in the specific mill, and how well the operator can keep his other duties up. Practically all men like to have enough to keep them fairly busy all the time, at least the foreman would like to have it that way, for an idle mind is a mischief breeder.

Summing up the whole matter, it is simply watching and regulating what is a day's work by actual experience under the conditions that exist, being fair to all.

T. A. D. (GA.)

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How Should Trumpet Bore Sizes be Determined?

EDITOR COTTON:

Is there any way to determine the size of bore for trumpets on the cards and drawing frames other than the standards established by the machine companies? I would appreciate some opinions regarding trumpets for both processes on 68-grain sliver. I should be glad to have the readers of COTTON give me their opinions as to the size trumpets to use for this sliver. I would especially like to have "Wash" express himself on this.

G. N. (GA.)

End Breakage in Spinning.

EDITOR COTTON:

How good is the spinning running, is a question often asked by the mill officers. The answer usually is that the spinning "is running good". Sometimes the answer is that it "is going bad". In this article it is proposed to ask how well is the work operating. Or, if it is not running well, how badly is it going? The only correct solution of this problem is to make careful tests to ascertain the exact status of the conditions under observation.

In one of the leading mills of New England a new kind of test was recently made—to determine the total ends down per hour in the spinning. At the same time an effort was made to determine the exact time down per end and the total time lost, together with the amount of waste made. It does make a big difference in a large mill as to whether broken ends are pieced up at once or are allowed to be down for a time.

The test was made during a period of one hour, on six sides of 224 spindles each, 15s yarn, one spinner's work. The speed of the front roll was 145 r.p.m.; cylinders, 1050 r.p.m. The yarn was warp with standard twist and filling wind. The empty bobbins were ¾-inch in diameter; with 1¾-inch rings. The traverse was 7 inches. The ends were pieced up as rapidly as possible, and the six sides were closely guarded under the watchfulness of the attendant, together with the superintendent and the overseer who conducted the test. The greater object of the test was not only to determine how many ends would be broken and pieced during the period of the test, but also to ascertain what could be the minimum amount of time necessary to have the ends down when a spinner gives close attention to her work.

Following is the record of the test:

Total time of test	One Hour
Total sides	Six
Total spindles	1,444
Total ends down	76
Total time lost by all ends down	3,330 seconds
Average down per end	44 seconds
Average ends down per minute	1 26/100
Average ends down per side	12 2/3
Average ends down per spindle	1/19
Total waste made	480 grains
Total waste per spindle operated	40/100 grains
Average waste per end down	6 2/3 grains
Ends broken as a result of other ends breaking	6
Ends broken from roving running out	4
Ends broken by hard roving	1
Ends broken by single roving	1

The mechanical conditions were as perfectly adjusted as possible. The cotton averaged one-inch Middling staple. The processes were: two processes of pickers, cards, two processes of drawing, two processes of roving, together with single roving in spinning Cork covered top rolls on

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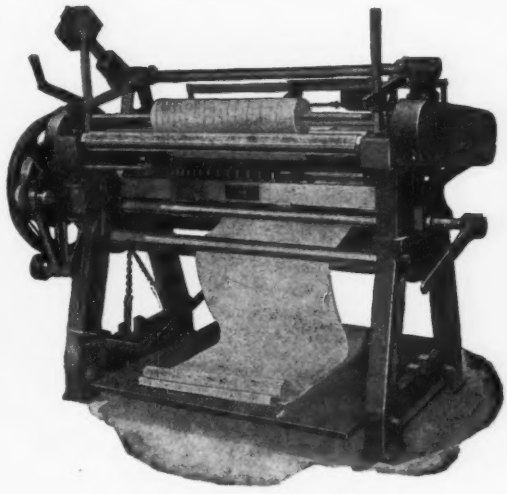

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drawing frames; solid top rolls on all roving frames, leathers covered; single boss top rolls on spinning; temperature, 76 degrees Fahrenheit; relative humidity, 68 per cent; band-driven spindles.

Two ends were down five minutes, and this was the longest time that ends were down at any one time. The least amount of time an end remained down and unpieced was five seconds. Most ends were down for ten seconds. This being the general amount of time that it took this particular spinner to piece up the ends. No attempt was made to register fractions of seconds.

Of the ends pieced up, 90 per cent were pieced up by the first attempt, seven per cent on the second attempt, and the other three per cent required a third effort. That is, even a good spinner does not always succeed in piecing an end at the first attempt. In other words, they often misfire, and this consumes extra time.

Another thing which must be taken into consideration is the delay caused by a bobbin which is not pulled off of the spindle the first time because it sticks or remains somewhat frozen or fastened to the spindle, as it were. Again a spinner must oftentimes find a lost end on the bobbin. Sometimes, the traveler has flown off and must be replaced. If the broken end winds on either the steel or top roll, it will take more time for a spinner to prepare the way for piecing up. Moreover, the act of piecing up itself involves many motions. No less than thirty-odd motions are required to piece up a single broken end. This does not include the extra motions necessary to remove waste from rolls, etc. There were all told 2,580 motions required in piecing up the 76 ends in this test. But taking into consideration the counter motions needed, such as walking from end to end and from side to side, creeling, cleaning, etc., it is estimated that a spinner will make about twice as many motions as it takes just to piece up an end. Therefore, over 5,000 motions per hour, or 50,000 per day and 300,000 per week, may be more accurate.

If the breakage of ends can be reduced even five per cent this will relieve the spinner to the extent of reducing the number of motions 15,000 per week. Therefore, the value of making tests to ascertain the exact condition of things should not be overlooked in efforts to economize and induce intensive service in cotton manufacturing. It can be readily seen that piecing up ends involves much labor, constituting about 50 per cent of the cost of spinning itself. So it goes without saying that chief effort of an organization should be intensively spent upon securing every possible advantage to make the work "run good". Preventing the breakage of ends not only reduces labor, but it also increases production, promotes quality, and likewise decreases cost.

N. R. (CONN.)

Picking Warper Tenders.

EDITOR COTTON:

The writer would like to know how most of the operating executives pick their warper tenders. We had not given this subject much thought until recent years, but the matter was brought forcibly to our attention. It so happened that when one of the regular warper tenders wanted to be out for a day the one next in line would be put in that one's place and, seemingly, could fill it just as acceptably, turning off as great a production, but, oh my! the laps we would have on the slashers when the substitute's beams reached that department. We studied this situation from every angle, trying to find out the cause, when one day we happened to notice that she, the substitute, became very ill tempered over not being able to find an end on the beam to tie up a broken back. She grabbed the end indifferently and tied it up. From then on we began to watch her and we found that her temper would run away with her when she could not find the ends handy. Of course this made a lap on the slashers by not getting the ends straight before tying them together on the beams.

From then on we have made it a practice to pick the even tempered girls to do the work, or to learn on the warpers and the greater part of our laps on the slashers have been eliminated. Besides this, the creel hands who help to creel the warpers have less trouble with the warper tenders and they get along better, and this means more production, better work, and better working conditions among the operatives in the department. Together with this, the section foreman in this department must be even tempered. The days of ill temper in all dpartments should be a thing of the past. Harmony should prevail.

T. A. D. (GA.)

How Can the Breaking Strength be Improved?

EDITOR COTTON:

I shall appreciate seeing in "How Other Men Manage" some suggestion as to the best roller settings on drawing, slubbers, intermediates, roving frames and spinning under the following conditions:

We use full inch local cotton. We run a 13-ounce lap .57 grain card sliver; .57 grain drawing sliver (single drawing); .55 hank slubber roving; 1.40 hank intermediate roving; 3.70 hank jack roving; making 20s yarn. We are putting standard twist in all but the jack roving, which is a little over.

We are not getting a standard break, and we are trying to get a layout which will improve our break from 82 (6.2 per cent moisture) to 88 or 90 pounds.

C.E.B.(N.C.)

A Spinning Room Kink.

EDITOR COTTON:

How many textile men, such as superintendents or overseers, have entered a ring spinning department and have noticed the weight levers? Very few, I imagine, but here is a small spinning frame accessory, and although it is very important, it is sadly neglected. Why? I presume because it is hidden under the steel rolls in an out-of-the-way place.

Experienced men know that if the weight-lever is not properly adjusted it will affect the yarn during the drafting process. If the frame top roll is designed to carry a leverage of say 28 pounds, the levers, if not properly adjusted, will either increase or decrease the 28 pounds. The levers should be as level as the adjusting lever screw will permit.

I will cite an actual fact pertaining to levers, which occurred in my department. While I was walking through my department a spinner stopped me and told me that there was a back end which was giving considerable trou-

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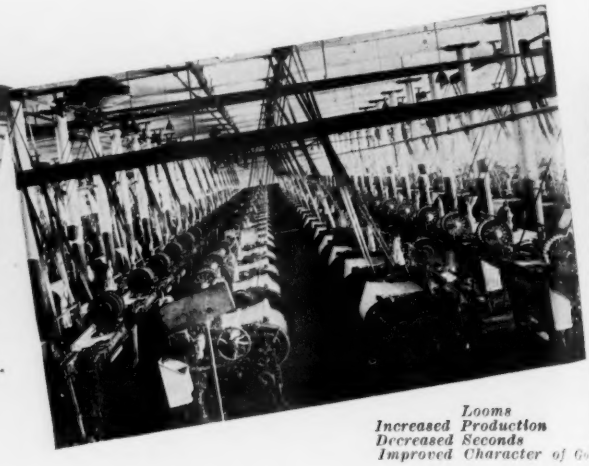

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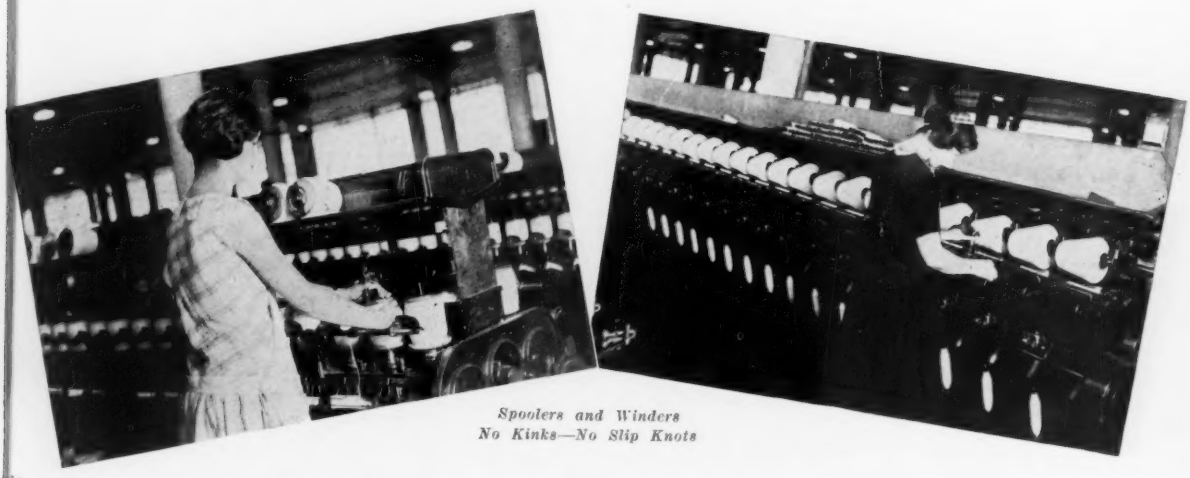

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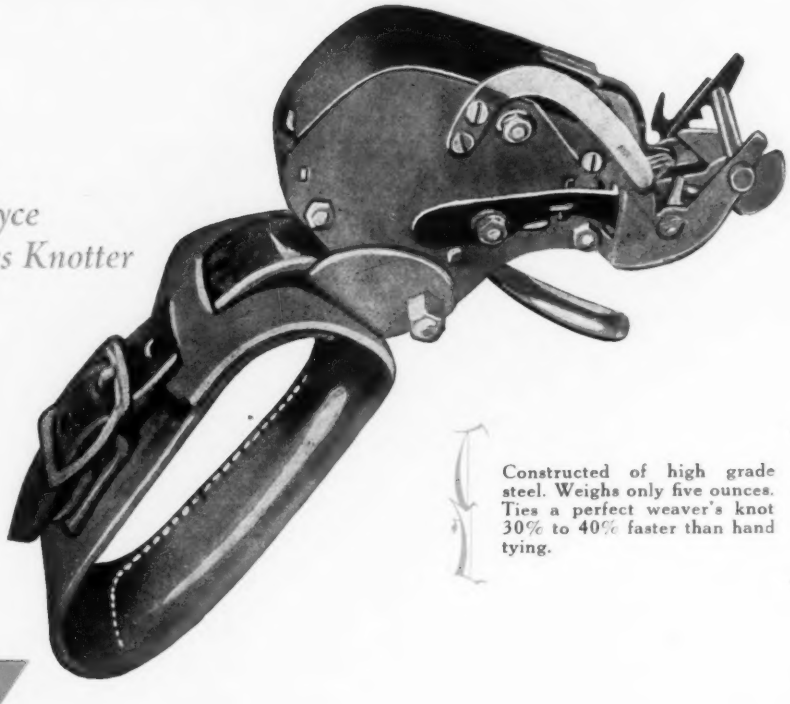

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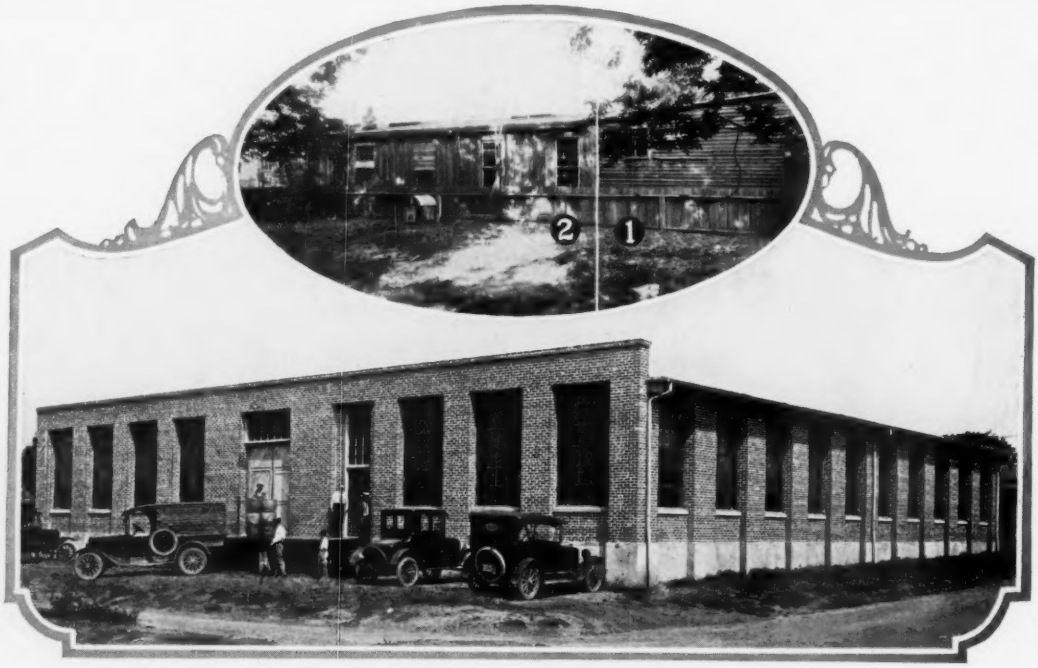

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ble. The section hand, in fact two section hands, tried to make the end stay tied up, but without success. I investigated the top rolls, the guide-wire and spindles; all seemed o. k., but one thing had been overlooked, the *weight-lever*; it was surely one inch too high from its normal position. I lowered the lever to its normal position, and to this day —and I have made several inquiries—the spinner told me the end had never given any more trouble. I cite this particular case as proof of the importance of the proper setting of the weight-lever. I hope that this will prove of some benefit to some reader of COTTON, as the letters I have written, and intend to write from time to time, are based, not on book knowledge, but on 23 years of practical experience and study, trying to solve the problems incidental to ring spinning frames. B. D. (R. I.)

Causes of End Breakage in Ring Spinning.

EDITOR COTTON:

There are a multitude of causes which result in ends on the ring frame persistently breaking down, thus giving rise to what is generally spoken of as bad spinning.

On all ring frames, spinning is accomplished with the yarn under considerable tension, which is necessary for the following reasons: the revolving of the traveler around the ring to insert twist into the yarn; the building up of the yarn on the bobbin with the required degree of firmness; and the production of yarn possessing the greatest possible regularity and roundness.

Bad spinning may occur when the cotton being used is weaker than normal, or when the settings at the cards have been changed. The trouble experienced during the spinning of this material at the ring frame may sometimes be relieved to some extent by changing to a lighter traveler to reduce the tension, but the bobbin is not quite so firmly built when using a lighter traveler, and if too great a change in travelers is made, the ends are more liable to break down when winding at the shoulder or large part of the bobbin. Instead of changing travelers, it may be more advisable to strengthen the yarn by putting in additional twist.

The mixing of long and short staples of cotton, rough and smooth cotton, damp cotton all have a bad effect on spinning conditions. When cotton is below the usual standard, more attention should be devoted to maintaining the top and bottom rolls clean, also the clearer boards should be picked more often.

An insufficiency of humidity will sometimes cause breakage; the greater tension in this case arises from the increased friction of the traveler on the ring.

In the event of roving being overdrafted or stretched previous to its insertion in the ring frame creel, breakage of ends will result. Such roving is, of course, beyond the possibility of being remedied, and it is advisable to replace the majority of the faulty roving by more perfect roving, and only sparingly using the roving temporarily rejected.

The roving received from the cardroom should be well built, correct in hank, free from running over and under, and with the minimum of faults such as slubs, single, double, and stretched portions, if good spinning is desired.

Roving breaking back in the creel is another cause of end breakage. When examining the roving as it revolves in the creel, particular care ought to be exercised in determining the cause of the roving breaking.

The roving may be stretched or broken owing to a blunt-pointed skewer, or an obstructed traverse eye, or it may be due to waste collecting at the top of the skewer. The porcelain cups for the lower ends of the skewers should be smooth, and cracked ones replaced. The skewers should be well-pointed; creel guide rods adjusted in the correct position, especially when using fine roving; and the fly waste removed from all parts of the creel frequently.

The rolls must be adjusted the correct distance apart in accordance with the cotton being spun and the prevailing conditions. All defective rolls should be replaced.

Excessive end breakage will result if spindles are not set properly. Absolute steady running and correct adjustment of the spindles are essential as regards their being vertical and concentric to the ring.

The importance of accurately setting the thread guides is realized more when spinning fine counts, but even on coarser counts it is a detail which should be attended to. Nicked or worn thread guides will also cause ends to break.

Worn rings will cause ends to break. An examination of the rings, especially if they have been in use for a considerable period, will reveal roughness, such as wavy undulations on the inside of the ring; and in such a case, burnishing of the rings followed by using a polishing powder sometimes removes the defect. In extreme cases, it may be necessary to replace the rings by new ones.

If the distance between the thread guide and the tip of the bobbin is too great or too small, there will be breakage of ends.

On frames which wind the open spirals of yarn, or the crossing threads on the bobbin from nose to shoulder, there is sometimes an excessive breakage of ends, especially when spinning soft yarn, or when using cotton too low in quality for the counts of yarn. The quick downward movement of the ring rail from the rolls tends to increase the tension placed upon the yarn, resulting in a greater liability to pull down the ends. This condition can be sometimes relieved by reversing the builder cam and having the fast motion of the rail occurring when it is going up, and the slow motion on the downward movement.

Neglect in oiling spindles will produce yarn of insufficient strength to withstand the tension.

The rings, ring rail and separators must have the fly waste removed at frequent intervals to prevent its becoming attached to and increasing the weight of the travelers; otherwise excessive tension is imposed on the yarn, which is therefore weaker and breaks down oftener.

Excessive vibration may lead to defective drafting and cut yarn. The vibration may be caused by worn brasses in the roller stands, or the rolls may be out of line.

The use of bobbins which insufficiently grip the spindles permits slippage to occur, followed by soft yarn and ends breaking down.

Excessive end breakage can be reduced by careful attention in determining the cause and applying the remedy, which will result in less waste and a better yarn, which should help succeeding processes. R. A. (CANADA).

Belt Slip.

EDITOR COTTON:

I read with interest what "B.T.E." says in the November issue of COTTON, page 17, under the title, "Variables".

What interested me most was his remark on belt slip, as power transmission is more or less my specialty, and I

wish to take issue with him regarding a few of the things he says.

There should never be any belt slip. If a belt slips it is usually overloaded.

There is always some loss due to belt creep, but with leather belting that loss never amounts to more than 1½ or 2 per cent. It is therefore obvious that to eliminate only 1½ to 2 per cent of creep by the use of the individual motor which is notoriously inefficient, in very poor engineering. Any electrical engineer will admit that the best form of belt transmission is more efficient than the best form of electrical transmission.

I am opposed to the use of belt dressings in general because most of them are harmful to the belt. The best way is to use high grade belts and keep them clean. The best belts have a naturally high coefficient of friction. They do not need belt dressing excepting that once in a while enough oil should be added to replace the original oil that has evaporated and thus keep the belt from drying out.

As most cotton mill officials certainly know, or should know, under most conditions group driving has been found to be much more economical and efficient than the individual direct motor drive.

S. F. (N. J.)

Causes of Streaks and Shiners in Rayon Fabric.

EDITOR COTTON:

In the December number of COTTON, "I. M. (Pa.)" asked for information as to the causes of "uneven lines" in woven rayon fabric. I will say for the benefit of the readers, who will not see the sample which he sent to show the difficulty, and which was submitted to me for an advance opinion, that the trouble is what is commonly known as shiners. The sample is of a fabric woven with cotton warp and rayon filling, and there are streaks which run fillingways of the cloth. The sample did not include the whole width of the cloth from selvage to selvage, and the streaks extended to the end of the sample, but it is evident that the streaks did extend across the entire width of the cloth, and for at least six inches lengthways. It is thus probable that the difficulty came from only one quill or cop of rayon, since the weave seems perfect up to the point where this quill came into use, making it apparently a case of streaks caused from one bobbin or quill with uneven tension.

In his letter, "I. M. (Pa.)" requests opinions as to whether this difficulty is caused by the kind of rayon used, the treatment given it, or whether it might be the result of poor winding. My opinion, based on a number of years' experience operating mills weaving rayon goods of this character, is that the cause of the trouble lies in the loom or shuttle, and not in any of the preparatory processes. In fact I believe—and I have had this opinion concurred in many times—that 75 per cent of the streaks in goods of this kind are caused at the loom. I realize, however, that many people attribute this difficulty to winding, many times, largely, I think, because without experience, this would seem to many people to be a probable cause of the trouble.

It is of course possible to stretch the rayon in winding, but our experience has been that in a great majority of cases, the shiners are caused by uneven tension on the rayon as it is drawn from the bobbin in the shuttle. This may be caused by improper lining of the shuttle, improper tension device in the shuttle, or by the wrong setting of the loom, such as shuttle rebounds and the results of other improper adjustments. The type of quill or cop also has a great deal of effect on eliminating shiners.

While it may not be of direct interest to "I. M.," perhaps this might be a good time to bring in some further discussion with reference to weaving rayon that might be of help to some readers on this class of work. Referring again to the packing or type of lining inside of the shuttle for holding the rayon firmly as the shuttle passes across the loom, I know that many people use and recommend rabbit fur or a similar material for this purpose; but in my experience, the best thing to use is ordinary clearer cloth.

The rabbit fur gives a firm grip on the yarn, but since the hair is long, it hugs the bobbin snugly for the entire length, including the tapered portion at the top end of the bobbin. The result is that if there should be a knot in the yarn anywhere in this tapered portion of the bobbin, the fur would tend to hold the strand of yarn close to the bobbin, making it drag over this knot and causing a tight pick or streak. The clearer cloth, on the other hand, being comparatively stiffer, touches only the main body of the bobbin, and has a nap of only about ⅛ of an inch, so that should there be a knot in the tapered portion, there is nothing holding the strand against the bobbin, and the yarn will have a tendency to balloon over the knot.

I do not know whether this additional discussion as to this point will apply in the case of "I. M.'s" question, but while discussing the general subject I thought I would express these thoughts. I would be very much interested to see the subjects of winding, slashing and weaving rayon discussed by the readers of your discussion departments.

CONTRIBUTOR No. 917.

EDITOR COTTON:

I notice in the December number that "I. M. (Pa.)" is having trouble with streaks or shiners in rayon fabric. There are several ways in which this defect can be caused. There is first the manner of processing. I have found that spraying or sprinkling rayon with rayon oil will cause an uneven distribution of the oil. The only way to eliminate this would be to immerse the yarn in the oil, wrapping the bundles of rayon in cloth and placing in the extractor.

Another cause could be spooling with too high a speed, or under excessive or heavier weight than would be required to keep the swift from jumping out of the brackets.

If the compensator on the quillers is allowed to bob up and down, jerking the rayon in an irregular manner, this trouble will result. The tension should be so regulated as to allow only a slight regular movement of the compensator.

It is possible that the fabric was made on a single shuttle loom, but using two different shuttles in the weaving. The nature of the defect, if such is the case, will indicate that the shuttle tensions are not adjusted alike; one exerting a strain on the rayon. G. H. (S. C.)

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Cracked Selvages.

The following answers have been received from different mill agents and finishing plant executives as to the probable causes of cracked selvages, when the cloth is mercerized and dyed. This was brought up by "Contributor No. 3005," in the November number, page 39. The cloth, he said, is made of 30s and 33s carded warp, with wet twisted selvage, consisting of sixteen 2-ply ends on each side, having 12 turns to the inch, selvage of same number of yarn as body of cloth. He asked whether dry twisted selvage would prevent cracking, and for any other information on the subject.

One man answers as follows: "In our opinion the cracked selvages are caused by tight selvages. This causes cracked edges in the various processes and is generally quite apparent on goods that are mercerized. Any cracked selvages found in the usual course of work are undoubtedly caused by unusual tension somewhere, but in cases of this kind the trouble should be readily found. Where there are tight selvages coming from the mill, however, it is a condition that the finisher cannot rectify.

"Where goods are woven with a very heavy selvage and possibly wider than usual, in jig dyeing there is quite apt to be breaking of the selvages at this point because of the selvages building up on each other, thus causing more tension at this point."

The next reply states, "I note that the cloth mentioned is a 30s or 33s carded warp with selvage made of two-ply ends, the yarn being the same size as that in the body of the cloth. I never had any experience on selvage yarns that were wet-twisted. It is barely possible that this may have something to do with it, although I doubt it very much.

"In running a tape selvage, the setting of the selvage harness sometimes has quite a little to do with the results, and it may be possible that they are lifting the shed on the selvage harness too high. I would suggest dropping it lower if that is so. Also, the manner in which it is reeded. It may be that the selvage ends are drawn through the reed two in a dent. If that is the case, I would suggest that they be drawn one in a dent. I presume the selvage ends are run into the loom beam along with the body of the warp. It may be that the ends are not spread sufficiently, which would cause them to build higher than the body of the warp. In this event, that would give trouble.

"A tape selvage often proves to be a finicky thing which is one reason why some mills studiously avoid it unless compelled to use it.

"Of course a 30s yarn twisted two-ply would be about twice the diameter of the warp thread. If the other points mentioned check up, it might be that a 50s 2 in the selvage would give better results. My suggestion is, however, that the loom be checked up first, dropping the shed on the selvage ends, and also a method of drawing it into the loom reed—the two principal points which oftentimes escape attention and cause trouble."

The third man offers the following suggestions, "In reference to cracked selvages when cloth is mercerized or dyed, these could be caused by the finisher or could be the result of tight selvages from the mill. We have found that sometimes we get cracked selvages in mercerizing when the frame happens to be running a little faster than the padder; also we sometimes get them on the wash-box end. In

(*Continued on page* 281.)

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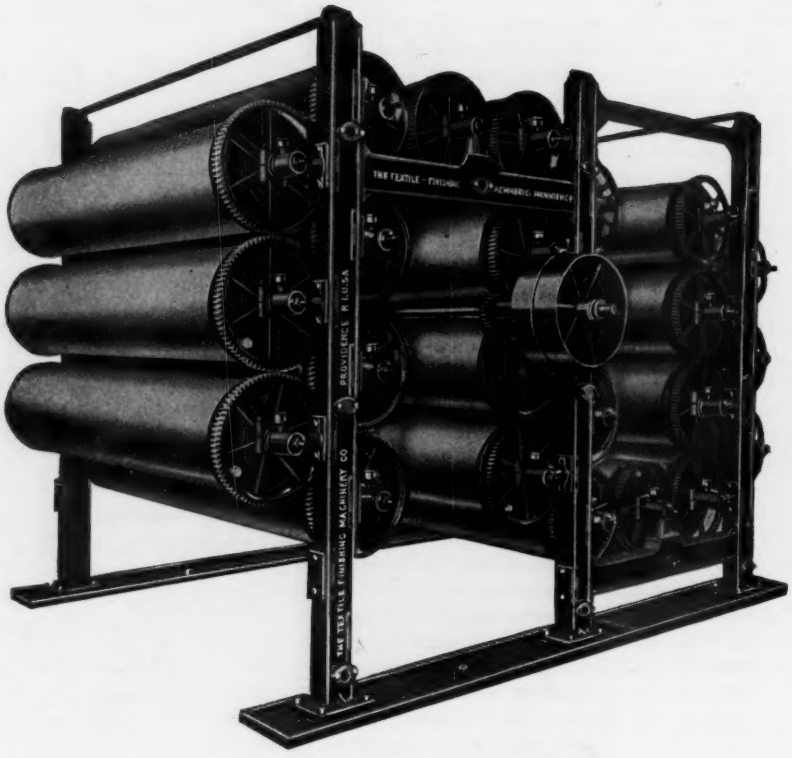

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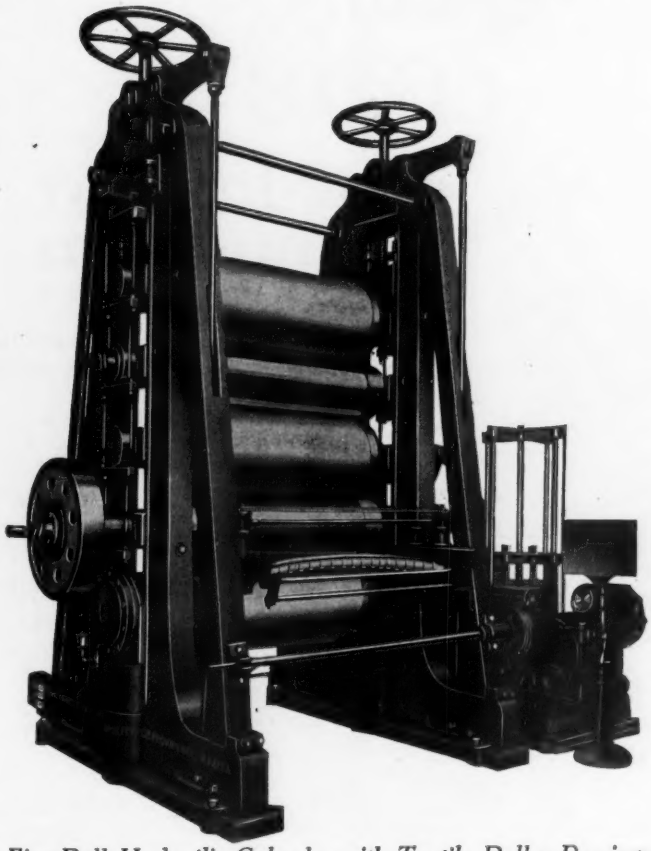

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(*Continued from page 277.*)

dyeing, frequently they are caused from the rolls building up on the jigs.

"I am more inclined to think, however, that the trouble is due to tight selvages in the grey goods. When we get cracked selvages on wide sheetings, they generally run through one piece and stop at a seam and when we get into trouble like this we generally go back and look for tight selvages in the grey goods."

The next reply comes from a finisher, as did the third answer. "In considering the cause for broken selvages, the body of the cloth and the way the selvages are woven must be given due thought. If the selvages are woven from the same beam and woven 1x1 plain, the contraction would be greater in the selvage than the body of the cloth, resulting in what is known in the finishing game as tight selvages. I have always thought that this trouble can be overcome by having the selvages beamed from separate spools and with separate tension on each spool.

"Another factor which causes considerable damage to selvages is excessive tension used in mercerizing. This is a matter that is under the control of the finisher.

"In the question it is stated that the selvages were made of two-ply yarns. We have found by experience that a greater contraction takes place in the process of mercerization when two-ply yarns are used in the selvage than when single yarns only have been employed.

The trouble is tight selvages, etc., in the opinion of the next man, who says, "We have had considerable trouble at times due to this condition, which we have always attributed to the construction of tight selvages, wire selvages, or uneven tension while weaving, and I would think that from individual lots damaged in this manner, the source of the trouble could be easily determined. I also think that the statement as to the selvage being a different twist to the rest of the goods would have some bearing on the trouble. Summing the whole matter up, it is due to faulty selvages rather than to the finisher's operations causing these cracks."

The last answer in the group says, "If this occurs in any properly run plant where the tension in the bleach house and mercerizing is correct, we naturally look for tight selvages in the weaving. This does occur occasionally but we seldom have any trouble because our bleach house is new and our mercerizing range is also new and everything is in good condition.

"If this trouble is occurring in a mill that finishes its own goods I should expect to find tight selvages. Also, it would be wise to have a man who understands such things go over their ranges and see that there is no undue tension anywhere. Cracked selvages can occur on any cloth if there is undue tension at any point in the ranges."

Another correspondent offers the following solution: "We would suggest that on the mercerized and dyed goods, your contributor use the tape selvage motion, with ply yarns similar to those he has mentioned, running these ply yarns from spools, and not through the sizing at the slasher. We also believe it would be better if the yarns were dry twisted, as a dry twisted selvage will have more stretch than the wet twist, and this will have a tendency to prevent the selvage from cracking."

The last reply covers the subject in this manner:

"There are several things that will cause cracked selvages. One of the biggest causes lies in the harness not being properly set on the loom. If one shed is higher than

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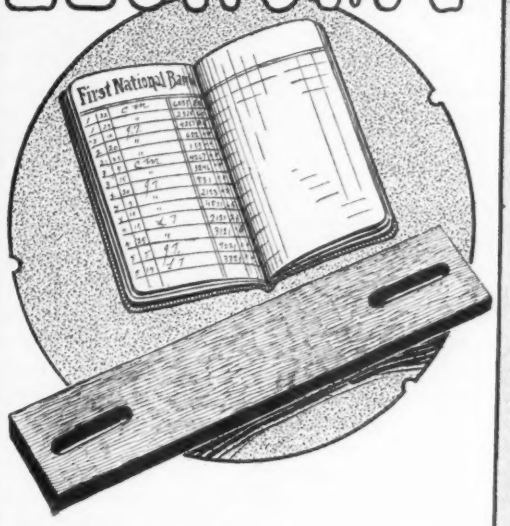

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the other the selvage will crack. It is almost impossible to keep the harness perfectly lined when using leather harness and jack straps. I would advise the use of tape selvages, and then I am sure his cracked selvages will disappear. I have used 2-ply yarn and single yarn and have tried everything else under the sun to get away from cracked selvages. I never fully accomplished this until I put on tape selvages.

"With reference to using wet twisted yarn, I should think that a dry yarn would be the best as the contraction should be the same as the body of the cloth. So far as twist in the yarn is concerned, the least twist that could be run would allow the selvage threads to give before breaking, as very hard twisted yarn would have a tendency to break before stretching very much."

EDITOR COTTON:

I see in the November number of COTTON that "Contributor No. 3005" is having difficulty with cracked selvages when the cloth is mercerized in dyeing. He makes his goods of 30s and 33s carded warp with 16 2-ply ends of the warp yarn on each side, having 12 turns to the inch.

I want to give him an experience that I had recently in the hope that it will help him. I am finishing goods made of 15.50s and 14s, and I found that the selvage was cracking so bad on some pieces that it would peel off. I found that the selvage was rolled or turned down right on the edge, making it about four times as thick as the face of the goods. When it went through the calender rolls it was mashed so hard that the selvage cracked. I raised the calender roll and stopped this difficulty.

J. L. G. (S. C.)

The Incentive of Promotion.

EDITOR COTTON:

A conversation with a very near friend lately, leads me to pen a few lines to your magazine simply to outline what to me seems to be quite a serious situation; a situation that possibly sometime in the future will be the keynote to the problem of securing the best workers to man the textile plants.

The conversation began by recalling some of the conditions operatives were compelled to work under some few years ago, namely the longer hours and the wages of that time as compared to the present hours and the average wage of today, and finally settled into quite a lengthy speech by my caller in somewhat the following manner:

"As I think back over the years that I have spent in the mill, I at times wonder what is to become of the boys that started with will and determination to fortify themselves with knowledge of an industry that had all the earmarks of a lasting livelihood and was really a basis of a trade for the boy who could not, at that time, afford an education such as is given the average boy of today. We didn't in those days dream of obtaining textile knowledge in any place other than a mill. We were forced in many cases to leave school before our ninth grade was completed and assist in the support of a large family and, while invariably every member of the family worked, the total wages added together rarely exceeded the individual pay of an overseer of today.

"I started at what was termed the bottom of the ladder. I was assigned to a combing department and given a certain number of comber backs to keep clean, a position that looked to me to be equal to that of a president, and I have doubted many times that a president ever felt prouder. The position at that time paid ten cents per hour, and at the end of the week I became the proud possessor of $3.60, of which my allowance was never over 25 cents and quite often ten cents was generally accepted for spending money.

"Every boy in those days dreamed of climbing the ladder of fame as a textile manufacturer and spent many hours trying in every way, shape and fashion to improve his knowledge in order that he would, sometime in the years to come, be at the head of the industry of which he was at that time a part. As he proved his capability from time to time he, or I, as the case happened, received a promotion that threw greater inspiration into our being and urged us on, ever on, to obtain the higher positions as other boys of greater ages were advanced.

"From my first undertaking in the mill as comber cleaner I was transferred to the spinning room and placed in a crew of so-called frame cleaners with whom I worked for sometime. Then I was called before the family and was told that I was to go back to school and that I was to be kept there until my education was completed, which of course would have been perfect in every way, shape and fashion if conditions had warranted, but as I remember the case, textiles seemed to be having an off year and I was obliged to go into the mill again to help the family budget, and from that time on I have spent practically all of the better part of my life climbing or trying to climb the ladder of textile progress.

"Through hard work, and grasping all opportunities presenting themselves, I found at an early age that I was in a fair way to become an overseer in the carding department. I also discovered that while I had tried to grasp all of the fundamental principles of cotton manufacturing while climbing to the overseer's position, I had overlooked many sound manufacturing principles, so I determined to retrace my steps and find in each department the better, if not the best methods of handling all classes of cotton under all kinds of conditions which would enable me in the days to come to apply myself to any condition that should arise. I mean by that, I was determined to find a method that would apply in general to every cotton that came to me which would enable me to have, at all times, a room running equally as well at one time as another. By checking up on myself at regular intervals I have finally found methods that I have been privileged to use for many years and which enable me to keep my department running in such fashion that it is rare, yes, very rare, that there is what is termed bad-running work.

"In order that I might be relieved of as much labor as possible, I also learned that each department head should know all that was possible for him to gather about the other departments, and I have endeavored to do that for many years. First, I have tried to find one who was master of his own department, and have then spent many hours teaching him the fundamental principles of the other departments. In so doing I find that within my rooms I have five men (department heads) who are capable of operating any part or department equally as well as they do their own department, which makes things so agreeable that if any one of us should be away there is never a sign of anything that has been handled otherwise than it would have been had we all been there. I suppose that condition

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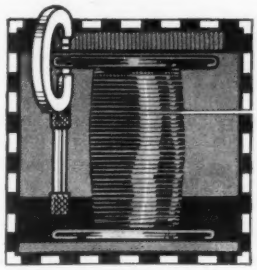

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exists in many other mills.

"These things not only gave the striving boy an opportunity to learn, but placed him in that capacity earlier in his career. I realize, too, that many new conditions exist today that we have never had before. I also realize that the educational systems of today place within the hands of our students the knowledge that seems to match in capacity the knowledge that the University of Hard Knocks has given the man of more mature years. But what is to become of those who have striven to accomplish the basic principles of the textile industry? For example, I have known of three instances in particular where men have spent their lives, or part of their lives, digging out every detail of the industry in order that they might finally become leaders within the plants that they have earnestly and honorably worked for, only to find that another has been advanced over their heads, forever forbidding them to even hope for further progress. In some instances these are young men directly from college; in other instances the supply has been taken from brokerage firms.

"I have not the least criticism to make if, in that change, the individual is worthy and efficient in capacity to fill that part of the organization to which he has succeeded, but the thing that is uppermost in my mind is what is to become of those men who have spent many and many a year in gathering the knowledge of the industry and finally are unable to use it only within the sphere within which they live?

"Then again, if we have arrived at that stage of the business where the inside men are no longer capable, in the eyes of the owners, to be further advanced, or the years of knowledge they possess accepted as the basic principle of the textile industry, what in the world is going to influence the forward looking boy to enter the textile industry for a livelihood, and what incentive is going to be presented to him to exert his full energy to climb to the top.

"In answer to the statement or suggestion that our textile schools are going to supply the leaders or department heads of the future mills is the thought are there among them enough boys, who, after spending their time in school and finally graduating and who have the ability to become superintendents or treasurers, are such boys going to be satisfied with overseers' positions which they must inevitably fill while others are brought from the outside and placed over their heads. Is that situation going to help fill or keep filled the textile schools, and even though we allow that the schools are kept full what is going to become of the boy who doesn't go to the textile school and spends his time in the mill as I, myself, have?

"Also, what is going to induce the operatives to enter the mills if there are no promotions in store for them?

"If a boy of ambition finds that there is nothing in store for him in after years he will never cast his lot with the textile plants. The whole affair seems to point toward the elimination of those men who were unfortunate enough to have lost the chances of education because of conditions in their boyhood days and the opportunities seem to be handed to those who have completed their college courses—all very fine fellows, without a doubt, but to me it doesn't seem hardly fair."

For some sort of sympathy, I suppose, the speaker directed his problems at me, saying, "If you had spent thirty-five or forty years in accumulating your education for a future and at the end of that time you were comforted with the aforementioned illuminative prospects, don't you think that after the best part of your life had been sacrificed you would feel that an injustice had been done you?" To which I had to answer, "Yes, I would."

"Now, it so happens," my friend continued, "that there is in many sections of the country a slight depression in the textile industry which will have a tendency to withhold a great many youngsters from even caring to cast their lot with such an industry and at the same time we find the men who have spent their lives within the mill with nothing in view for a better future for them, and so it stands to reason that their children will be guided into other channels if possible, and if we are to get our textile leaders from outside sources—just where, within a course of years, are we going to find our mills? Will the interior be up to its highest efficiency? Will there be a surplus of operatives such as one will care to place in command? Or where will we find ourselves? While, as a rule, I am not pessimistic, the outlook for this one industry looks to me as though it needed a few suggestions and much action relative to replenishing its operative forces if it isn't already too late."

After my friend departed I promised myself that I would offer the foregoing conversation to COTTON to see if other men looked at the textile situation in the same light, and if there were any who cared to express their views I should be very glad to read them.

N. E. W. (MASS.)

Old Timer says, "It is hard to escape from success," page 905, July COTTON. Inasmuch as Old Timer, in his article last July, answered some of the questions propounded by the present correspondent, we suggest that readers refer back to that number and read it again. Both articles indicate the advantage to the mill of a suitable promotion policy.—The Editors.

The Man for the Job.

EDITOR COTTON:

I notice the question asked in the February issue by "Contributor No. 1033", in regard to which man to select for the job, has been brought up again by "C.A.B.(Ga.)" in the November number, page 39.

In the original question, "Contributor No. 1033" stated that he had an overseer's job open, and was undecided as to which should have the job—the student or the fixer. He said the student had been with him eight months; but did not tell how long the fixer had been with him. However, he said the fixer was a real fixer and not the severe driver type and that he was the man to call on when production got down.

Thus we see that the fixer is competent to keep his machinery in shape, also keep production up. This man has been in some mill a good many years, and knows how to take care of the weak spots, handle help, and keep down seconds, and get maximum production at minimum cost. These things are vital to success, and he knows it. He has been working hard for what he has learned and dreaming of the time when the opportunity would present itself for his promotion. Possibly he has waited for several years for this opportunity.

Now, the student has his education, but possibly never worked a day in a mill before starting in the employment

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Grayling, Michigan

of "Contributor No. 1033". He has eight months experience. Well, I'll admit it sounds tough to be employed in a mill eight months and not reach the top—what about the fixer, working it out for ten, fifteen or even twenty years. Is there no reward for faithful service? The student might take a superintendent's job and meet with success, with only a few months practical training. He might hold the overseer's job, but he can't be competent, as the overseer comes into direct contact with the help and machinery and product.

As I see it, an overseer should be a leader and instructor, and it is impossible to teach that which one does not know. It is a certain fact that an overseer's job cannot be mastered in a few short months. I would like to have "C.A.B." read "Old-Timer's" article in the November issue of COTTON again. It is very timely and expresses very clearly the sentiment of the practical man.

Many a mill has lost money in seconds and depreciation of machinery on account of placing the student ahead of the practical man. The fixer can get the education while his job runs. So why not let the student have a couple of years of experience before placing him over the man who has labored hard and served the company well.

I wish "Contributor No. 1033" would write and let us know what he decided to do in this case.

T. O. M. (MISS.)

Reducing Waste in the Mill.

EDITOR COTTON:

In your valuable paper I have often read essays on different topics relating to the textile mills, but seldom have I seen an article that treated the waste made in a mill from the opening of the bale of cotton to the finished goods. I have tried to transfer to paper my own ideas of this waste as made in a cotton mill.

It will be noticed that I have confined myself largely to the waste made by the operatives themselves and have not mentioned the waste made by the different machines, as this is a condition that is going on in every mill. Every machine in operation in a cotton mill will make waste if not in good mechanical condition, and most every mill employs men to take care of that end of it.

The three main causes of waste in a mill are, first, the condition of the machinery as to turning out good work. Second, the quality of the work or material being put through the machines. Third, the waste made by operatives themselves.

I may not give any new ideas, or discover any new waste, but I feel sure that I have written nothing that will do any one harm by reading it, and no one will be worse off by having brought to his attention the different kinds of waste for which he is responsible. It will also be noticed that the remedy for cutting down this waste does not require any special help or machinery.

In every department the man who can control, and who should be held responsible for, the waste made is the overseer of that department. In the picker room, or opening room, the bales should be weighed to see if the correct weight is there. Then the bagging should be cleaned of all good cotton sticking to it and the hoops and bagging weighed to see if the tare is excessive.

As the cotton goes through the picker the overseer should watch and see if any good cotton is coming out in the picker waste; if any is there he should set his grid

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bars to stop it. In this room much good cotton falls on the floor and is sent out as sweepings when it should have been put back in the work again.

In the cards we have another machine where much good cotton is sent out as waste. The condition of the cards is a big factor in the amount of strippings and screenings taken out. When the cards are stripped and the screen waste removed the overseer should look and see if any good cotton is being taken out. Especially is this true about the screen waste when the screens need resetting, or the card clothing is in poor condition. This is a serious matter and should be attended to. The clearer waste from the cards should be separated, as it is worth more money than sweepings.

On the combers, when set to take out a certain per cent of waste, each delivery should be watched to see that it does not take out more. Each week the percentage of each comber should be taken and any comber needing it should be reset. In piecing up broken ends the sliver left should be put in a can or box and put back in the work again. In cleaning the machines the waste should be kept separate and graded so as to sell for more money.

On the drawing frames, slubbers and speeders the operative in piecing broken ends either throws or lets fall on the floor the small pieces of clean roving. This may not seem to amount to much, but at the end of a day, or week, you would be surprised to see the amount let fall to the floor.

Another great loss in waste in the card room is the cutting of roving off the bobbins when there is enough on the bobbin to run one-half to a couple of hours.

In cleaning the machinery much more waste is used than is needed; many times an operative will use a half pound of waste to wipe up a spot of oil when a small piece would do just the same work. The result is a loss in the value between the price of stripping waste and sweepings. All card room sweepings should be graded into: soiled card, oily card and sweepings. Much money can be saved in doing this, for more money is paid for waste that is graded.

The man who should be held responsible for all this excessive waste, or at least he should see that it is corrected, is the overseer, for if he does not show any interest in his room his help can not be expected to do so.

The amount of cut roving waste made by each speeder tender should be weighed and checked each day, and a record kept.

The spinning room is next and we find that the spinner is careless about piecing up the broken ends and much valuable roving is turned into waste when it should have gone through the machine as yarn.

When the spinners are replacing roving in the creels they generally cut off quite a lot of roving from the bobbins that would run for one hour or more. A bobbin cleaning machine in a mill can save much waste, for the roving can be all brought to one place to be cleaned and any bobbin with too much roving on it can be returned to the spinner to be put into yarn.

In cleaning, the spinner should be careful not to throw roving or lap waste on the floor to get into the sweepings. Each day the sweepings should be inspected to see that it is free from this kind of waste.

The mule room waste covers the same ground as the spinning room, in fact it costs more to make mule spun

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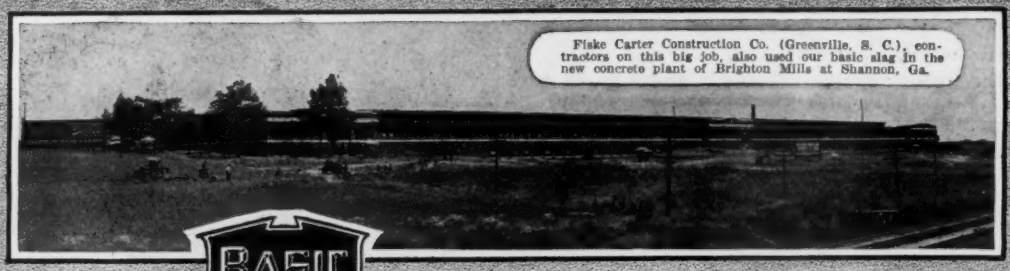

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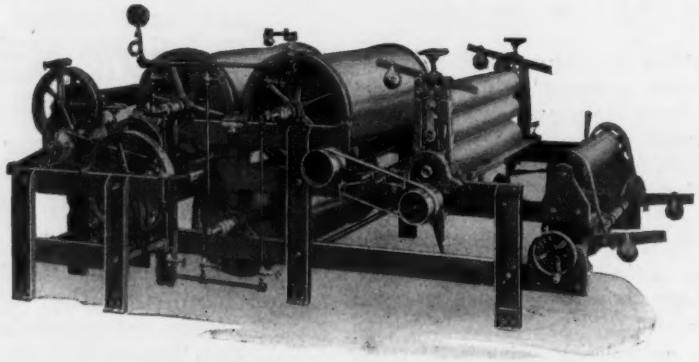

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yarn and the loss in waste would be higher in this room. All roving bobbins and yarn bobbins should be kept off the floor.

As we reach the spoolers we find the help cutting the yarn off the warp bobbins long before the end is reached, and often dropping it on the floor to go into the sweepings. Much waste and money can be saved by laying out the bobbins that will not run and having someone fix them.

On the warpers the handling of the spools by the warper tender is another source of waste. They break many a spool head by throwing them against the sides of the boxes.

From the warpers we come to the slashers where a little care on the part of the slasher tender in starting up a set will eliminate much waste. A good method for the slasher tender to follow is to allow a yard over the end of the last cut mark, on each warp that is taken off, so that when it reaches the drawing-in girls they can draw the warp in and still have enough yarn left before the cut mark so that when the warp is put in the looms and started up the full length of the first cut will be there. By following this method thousands of dollars can be saved.

But, the yard that the slasher tender added to the top of the warp taken off will leave the first cut on the bottom of the next warp short. It will be noticed on every warp running out that the yarn extending from the bottom of the beam to the harness and reed is waste yarn. This measures about a yard and a half and added to the yard put onto the warp that was taken off makes two and one-half yards we will have to add to the next warp so when the bottom cut is woven the full length will be there. The remedy for this is to turn back the measuring gear enough to make up the loss in length and the result is we have a full cut, when woven, on both top and bottom of each warp. It is the duty of the overseer to see that this rule is carried out.

Any waste made at the end of a set should be rolled into a ball, as it is worth much more money in this form, than when it is cut into pieces.

From the slasher we reach the drawing-in girls who can save waste by taking a little care in straightening the yarn when drawing it in. The use of combs by the slasher tender when he takes the warp off the slasher will keep the yarn straight so the girl will not have to wind off two or three yards to straighten it.

Coming to the weave room we will find quite a few classes of waste being made. First the loom fixer in starting up a warp will often pull down on the take-up gear and waste many yards of warp yarn, and at the same time making the cut to be woven short in length when finished. The result is loss in price of waste warp yarn and woven cloth, and means much loss to a mill in a year's time.

Another form of waste that is made by the loom fixer is in cutting out warps before time, or with many yards of yarn left on the beam. All warps to be cut out with yarn on the beam should be marked by the overseer or second-hand to see the cause, and to remedy it if possible. In a good many cases the waste can be traced to the way the slasher tender starts up his warp on the new beam, and the tension, and also the condition of the size he uses.

In mills that run cop filling, much waste is made by the weaver in the handling of the cop when putting it on the spindle by stuffing the cop and in many cases breaking it so it can not be used. Some weavers will pull out the tube of a stuffed cop and weave it as far as possible and try to make as little waste as they can. Other weavers will break the cop when they find they have stuffed it and

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Turns per inch	14.40
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Draft	16.40
R.P.M. Spindle	9300
R.P.M. Front Roll	205
Weight Top Roll	1100 grs.
Average Size	23.29
Average Break	126 lbs.

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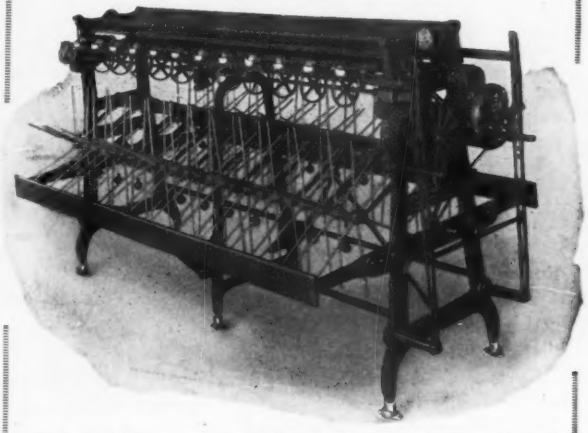

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the result is a good many dollars loss in money. This form of waste may also be traced back to the mule spinner in the way he handles it, or to the condition of the mule that spins it.

The throwing of cloth, filling yarn, and warp yarn on the floor to go into the sweepings is a form of waste that loses much money when sold at the price paid for sweepings. The handling of warps as they come into the weave room from the drawing-in room, and where they are placed in the weave room, has a good deal to do with the making of waste. The waste problem in the weave room is a big one, and no overseer should feel too big or too proud to cast his eyes down to the floor each day to see what waste he is making in his room.

After the cloth leaves the weave room it goes to the cloth room where the grading takes place. Many people imagine that no waste can be made in this room, but we should not forget that the value of the finished material is many times the value of cotton. The grading of the cloth is of vital importance to the welfare of any mill, and if not graded right is a form of waste that will run into a big loss in money for the mill. At the measuring machine or folder money can be lost by not setting the machine so as to measure a yard and not a yard and one-quarter inch. For example, a machine supposed to measure one yard delivers cloth measuring 36¼ inches, or a loss of ¼ inch on every yard put through the machine. We can see what a mill making thousands of yards of cloth a day would lose in cloth given away.

In the waste shed, where the waste is brought at the end of each day, we find a place where there is another form of waste made by the help. The sweepings should be placed on the floor or on a table so that they can be sorted and graded so as to get as much money for the waste as possible. In weighing the bags the correct tare should be marked on each tag before the waste is put in the bag. Many times the operative will guess at the weight of the bag after it is full of waste and the result is a possible loss in weight.

When shipping the waste we should be careful to mark the correct weights on the shipping list, as I have seen mistakes made in this way.

In conclusion, I would like to say again that the overseer of each department should not feel too proud or too big to look at his waste baskets at least once a day and to make a visit to the waste house once in a while to see the condition of the waste coming out of his room.

W. J. (MASS.)

Humidifying Picker Rooms.

EDITOR COTTON:

On page 825 of the June, 1927, number of COTTON, I notice that "Contributor No. 662" requests some information regarding the use of humidifiers in the picker room.

This is a subject in which I have always been interested, and while I do not profess to have made any revolutionary discoveries along this line, still I hope that I can offer enough information so that the time spent in reading it over will not be regretted.

To begin with, cotton remains cotton whether it is in the picker room or running through the spinning rolls. Due to the structure of the fiber, to run cotton successfully, or I should say more successfully, two things are vitally essential—moisture and heat.

However, while the foregoing is true, and widely recognized, the presence of both heat and moisture in, I can safely say, the proverbial ninety-nine out of every hundred picker rooms, is sadly lacking.

There are two good reasons for this; the first and minor reason is that the stock cannot be cleaned as effectively when moist as when it is dry. The second and very important reason, or rather obstacle, is because of the tremendous quantity of air that is constantly passing through the picker room via the fan exhaust pipe.

Under the present system of picking, one might as well try to heat and humidify the mill yard as to try to accomplish this in the picker room.

While I have never done any experimenting with heat and humidity produced artificially, I have taken advantage of natural conditions at times to observe results. On a warm, moist (but not too moist) day, advantageous experimentation can be carried on. Cotton run on such favorable days as that will run better throughout the entire mill. There is also less fly and waste made, and the break of the yarn is much better. However, the yarn is less clean when made from a lap run on a warm and somewhat damp day.

To humidify a picker room successfully, means must be employed whereby the air that escapes through the dust chamber can be cleaned, humidified, and during cold weather warmed, and returned to the picker room. That is the only logical way in which humidification of the picking processes can be accomplished. It will involve quite an expenditure at the start, but sooner or later, I feel that the more progressive mills will give serious consideration to the matter.

The fact that the cotton is not cleaned so well need not be a serious handicap. A few more cards allowing slower and better carding, will more than offset the effects of reduced cleaning at the picker.

I wish to emphasize one fact, so I have kept it for a closing number, having heard it said that what is seen or heard last is best remembered. While humidity helps materially in producing better picking, insofar as breaking strength is concerned, the real factor necessary to get the cotton through the pickers, so as to preserve as far as we possibly can the original staple length, is heat.

Heat opens up the hard matted lumps of cotton which makes a more even lap. Heat warms up the wax coating on each individual fiber, making it more pliable, instead of being brittle and easily snapped by the tremendous blows struck by the beater. So when you are ready to spend a little money on equipment and wonder how it can best be invested, saunter out to the picker room some cold bleak December morning in your shirt sleeves and you will think of just one thing:

Heat for the picker room. C. C. (N. J.)

An Opinion On Rolling Cotton.

EDITOR COTTON:

Replying to "Contributor 514," whose question "What Makes the Cotton Roll" appears in the July issue of COTTON, will say, I think if this contributor will examine the output of his Murray cleaner he will find that the Murray may be the cause of his cotton rolling up.

R. S. P. (GA.)

Knitting Section

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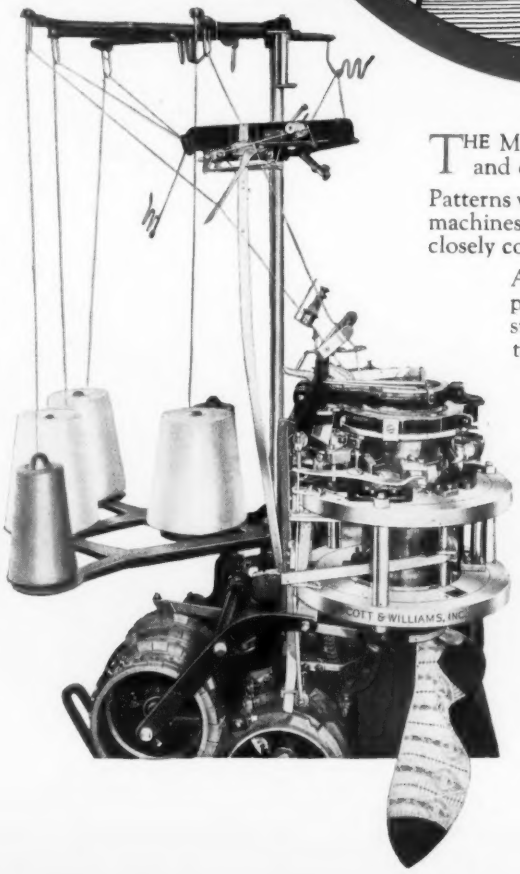

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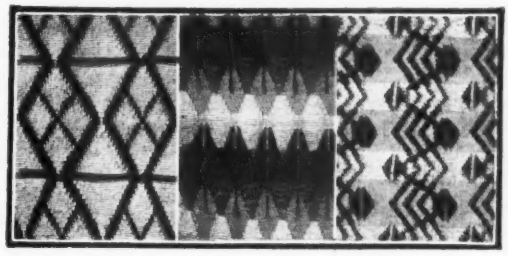

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Hosiery Cost and Production Control System

Material Advantages Obtainable Through Being Able to Check Up on Costs and Production Promptly and Accurately

BY HAROLD E. PARKER, Textile Economist.

PART ONE.

It has been stated truthfully many times that around the average knitting mill there is a woeful lack of accurate system in determining costs and controlling production. Perhaps the reason for its absence in many cases is that the executive in charge, being a business man and not an expert cost accountant, is frightened at the idea of any system involving the use of regular reports. He avoids them oftentimes by telling himself that they make too much detail work for which he cannot afford to pay, or that the systems he hears about are too complicated to be applied in his office.

This attitude has caused the following condition to prevail, in many plants—perhaps the reader may recognize it as his own situation:

The production records and payrolls for a given period are assembled. Each operation in the various departments is segregated. Alongside of the total dozens worked in each operation, the rate for this particular operation is set. Then the total dozens of each item is multiplied by the rate paid and the extension is compared with the actual amount paid out as shown by the payroll covering this item for the period in question. If the two extensions do not agree it is clear that there is an error in the records, which may either be an error in the figuring, or as more often is the case, the foreman has been slack in taking up the work and has allowed the workmen to turn in more dozens than they have actually worked. This form of pilfering is quite common with some workmen in mills running on low-end merchandise.

At times, when completing a lot of hose of a given quantity, the workman will report the lot as containing an extra dozen or two, and if the foreman is slack enough to accept the operator's count, the operator will be paid for the extra two or three dozens to which he is not entitled.

It is surprising how soon this form of minor pilfering will run into money. The workmen do not see anything wrong in this practice for they feel that the company is doing them an injustice, that they are under-paid, and that this simple way of getting even is quite the thing.

Of course, if each lot is properly tested for correctness of count and workmanship as it passes from operator to operator, and from department to department, it is impossible for a dishonest workman to get by without being detected; but, sad to say, it is commonly found that both the honest and dishonest will stick together, and the honest will not report the improbity of the dishonest, but will pass the lot on through and uphold their fellow workers in their dishonesty.

The writer has installed in several progressive southern hosiery mills an original cost and production control system, which, he feels, can be adapted to the needs of practically any hosiery or other knitting plant. That there exists a need for some definite form of cost figuring and production regulation in the big majority of plants, there can be no argument. Believing that this system in a measure supplies that need, it will be the purpose of this series of articles to describe it to an extent of interesting manufacturers, at least so far as investigating the practicability and simplicity of such a method and its possibilities in their own offices is concerned.

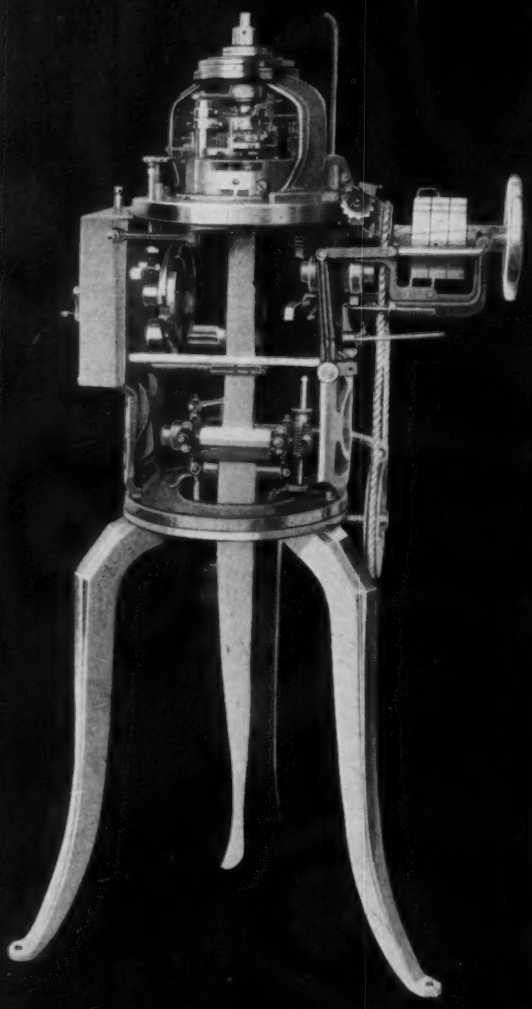
The ease with which this system provides a thorough checking up at the will of those in charge casts into the hearts of the dishonest workers much fear and uneasiness. The risk of getting caught will seem so great that they will not care to take the chance of slipping a few extra dozens through or of slighting their work. If the pivot men become dilatory and let up on their vigilance, it takes only a very few days for the workmen to notice it and soon the dishonest will be up to their old tricks.

As the daily, weekly and monthly reports in this system, which will be described step by step, come into the office, they are checked by the accountant or cashier and placed on the desk of the executive and the superintendent for their attention and information. With these reports before them, the executive and superintendent can tell at a glance just what is going on in the mill, and with what success the various operations are being carried out. The production of the various departments is obvious at a glance, and if any one of the departments is dropping behind and holding up the flow of merchandise this can be readily detected and corrected by the superintendent as he has before him the correct information on which to work. An accurate percentage of seconds, thirds, and any other imperfect work is always before his eye; the various items of waste are ever visible; the relation of the cost of each expenditure for labor, materials, and overhead to each other and the total cost and their final effect on the profit and loss account are apparent at a glance.

These reports not only help the executive to keep tab on the superintendent and the superintendent on his foremen, but they give the foreman the correct information as to just what he is doing, and just what each operator of his is doing and with what degree of efficiency. The system proves of practically as much value to the foreman in keeping him posted as to anyone else. Every superintendent knows what it means for the foreman to have the correct and necessary information at all times. It means that the foreman can get better and more work accomplished at less expense, and at a saving for the company.

An accurate cost and production control makes it possible for a manufacturer to anticipate the profits for a given period, for he can knowingly provide for all contingent and overhead expenses, including the visible and invisible wastes, costs of imperfects, yarn shrinkages, and other unusual expenditures and losses that invariably creep in, such as the failure to obtain maximum production, labor turnover and the like.

The effects of changing conditions of production and of prices upon the current profit and loss are reflected by the control charts, which indicate the effect that an increase or decrease in production, total cost of labor, material, or overhead has upon the current profit and loss.



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After such a system has been in operation a sufficient length of time to prove its value those in charge will find that they will rely upon the summaries set forth more and more in the guidance of the mills' policies.

The financial status of a company is always developed and strengthened by the installation of a cost and production control as the exhibits are proof of the monthly profit and loss and are of considerable advantage in the financing of a mill. The various balances arrived at, at the end of the month, aid in determining the purchases and manufacturing limits. In addition to the aid in the guidance of the general policies, correct costs indicate the measure of the efficiency of the various operations and show whether or not the material and labor are being utilized to the best advantage. It gives the superintendent a labor control, so that he can prove to his foremen the deadly cost of labor turnover and the effect that the constant training of new help has upon the final cost and the profit-and-loss account.

The control of cost and production is not necessarily an abstruse problem. It is based on common sense and requires not so much a deep knowledge of accountancy as it does a clear idea of manufacturing, as the three fundamental parts of any cost are material, labor and miscellaneous expenses. The one important thing to keep in mind is that if the costs follow and clearly reflect manufacturing they are correct; if they do not closely follow and clearly reflect each phase of manufacturing and expenditure, they cannot be correct.

The system must be drawn up to fit the specific mill, covering only the operations that actually take place and most surely including all of these. Some mills are more diversified than others and will require more diversified systems. The reports should be drawn up in accordance with the mills' requirements.

Suppose, for example, that the mill's New York sales office wires in, "Have offer fifty thousand dozen—any particular style the mill is making or can make—deliveries July and August, if at $3.25, wire."

With an adequate cost and production control system, the mill can readily refer to the cost records and tell at a glance whether or not it can afford to accept the offer at the price stipulated. This applies to new styles as well as to those being run at the time the wire was received. Suppose the salesman saw samples of a very attractive style, and wished a similar style, or has an offer for a large quantity of a style being offered on the market by a competitor. All he has to do is to wire the mill a description of the number desired and details in regard to delivery, price, etc., and the mill can immediately wire back the best price it can make the number for.

It is known that the maximum price obtainable on a given class of merchandise under average market conditions is set by competition, and not by one or even several manufacturers' costs; therefore, each style of hose has to be manufactured so as to go into a certain price range; consequently, a specific mill's cost of production has very little to do with the selling price of its article. But the manufacturer, when working up a new style, has to keep in mind what price range he expects to put the style in, and then put in quantities of such yarns and materials that the total cost added to that of labor and miscellaneous expenses will be such that the number can be produced at a figure showing a profit when the number is sold in its proper price range. If the total cost of a number is so great that it cannot be profitably manufactured and sold in its particular range, then the style has to be skillfully cheapened so as to meet the competitor's price and the price range, or else the number has to be improved so as to compete with the competitor's styles in the next higher price range.

Often, in periods of depression, the manufacturer wishes to know what price he can afford to make on various styles in order to keep the mill running. This being the case he can refer to his cost sheets and figure the very lowest price for which he can afford to offer a number. A proper cost and production control system will show that it would be more economical to shut down than to continue to operate at a less figure than designated. It is usually considered best to shut down when one is no longer able to obtain out of the merchandise sold the cost of the material and labor; however, one has to take into consideration the fact that it pays to keep the employees together and the organization intact so as to avoid such a heavy turnover of labor as will naturally take place if the mill is closed down.

The right system shows profit and loss by styles of production in order to disclose unprofitable styles as well as unprofitable manufacturing and selling policies. The reports show these figures once a month so that the manufacturer need not wait until the end of the year to know just how he stands. Without the cost and production control, the manufacturer must wait until inventory time for a statement, and then if he has more in the bins than was formerly there, luckily he has made a profit!

One mill which installed a cost and production control system which analyzes costs by styles found that forty per cent of the styles being manufactured were being made at a loss, and that the other sixty per cent had to carry the burden of the unprofitable forty per cent. The salesmen were instructed to push the profitable styles and gradually the unprofitable styles were dropped. The mill made four times as much profit on the same volume of business as it had formerly done when manufacturing without the necessary and correct information furnished by a cost and production control system.

The executive has demonstrated to him more clearly the necessity of controlling overhead expenses and he is shown in sufficient detail what the various items of expense are in comparison to the production and final cost. The system will work out many interesting things which will prove of untold value.

For example, the following questions might be asked of any mill executive:

Do *you* know the cost of waste per style per dozen?

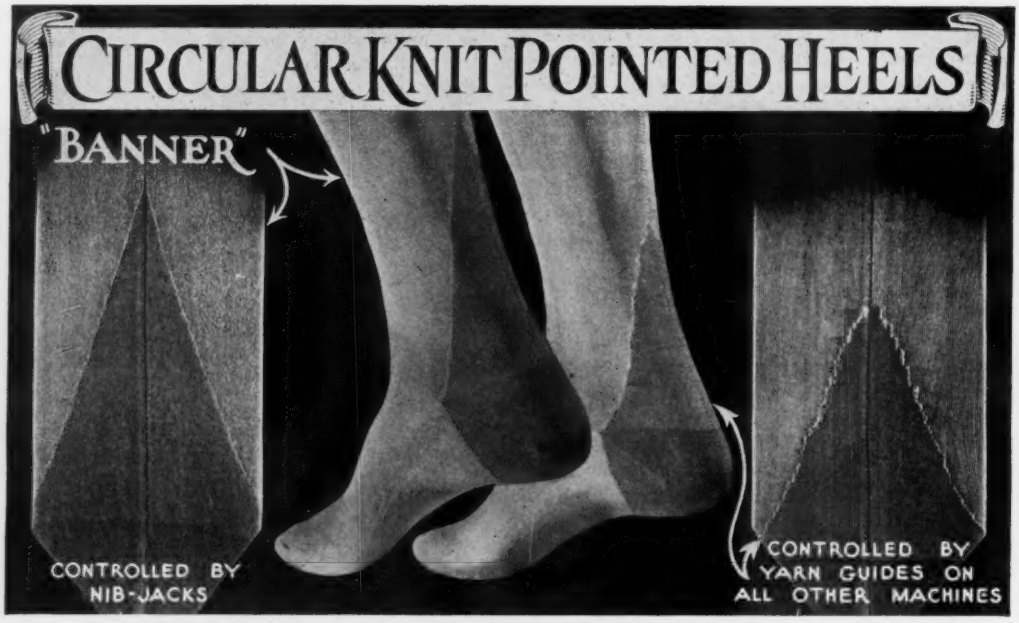
Do *you* know your actual percentage of imperfect work, and the causes and effect on the final profit and loss?

Is *your* production at the highest peak for efficiency and low costs?

Does the weight of the goods manufactured plus the number of pounds of visible waste equal the number of pounds of yarn put into process; if not, where does the discrepancy arise and what are the causes and the remedies?

Can you list the hundred and more items that enter into the final manufacturing cost; if so, what proportional amounts does each item represent in the final cost?

The answer to these questions and hundreds of others are at the command of the wise executive who has cost and production control in practice in his mill.



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The Behavior of Dyestuff Solutions

The Apparent Purity of a Dyestuff Varies with Its Concentration; and It Passes Through a Maximum Which Always Corresponds to the Same Intensity of Its Predominating Coloration

BY L. BLIN DESBLEDS.

In COTTON of August, 1927, there was an article by David Paterson, entitled "Difficulties in Color Matching." In his study, Mr. Paterson draws attention to some aspects of the problem of color matching with which it is, unfortunately, the general tendency, in some sections of the dyeing industry, to deal in a somewhat vague and loose fashion.

From the study of Mr. Paterson there may be drawn two salient and important practical conclusions. These two conclusions, which deserve to be especially noted, are:

1. A color match is perfect only if it remains so whatever the light in which the specimens are seen (solar light or artificial light;

2. The result of a mixture of colors which baffles the dyer can only be explained by an optical analysis of the coloring materials used.

The first of these two conclusions shows that every dyer should determine his color matches by, at least, two successive examinations in lights of different spectra—solar light and an artificial light, for instance. If such a practice of double matching increases the difficulties of dyeing and of the bath preparation, it possesses the very great advantage of relieving the dyer of a possibility of disagreement with his customers; and it, thereby, helps him to retain their confidence and good-will.

That it is of very great importance to the dyer to know the optical constitution of the dyestuffs he uses, everyone will agree with Mr. Paterson. Indeed, if dyers always took the trouble to analyze optically their dyestuffs, they would never experience "dismay and astonishment" when they see a bath become red by the addition of blue!

A blue which produces such a result possesses, as Mr. Paterson says, the property of transmitting the red radiations, which it contains, more easily than the blue ones. But, if it be true that the apparent change, or optical illusion, which takes place in such a case, varies with the concentration, Mr. Paterson has omitted to say that this change starts from *zero* for a concentration *zero* (pure water) passes through a maximum for a definite concentration and then again, tends towards *zero* for a concentration *infinity* (absolute black).

The case of litmus, at different concentrations, taken by Mr. Paterson to illustrate the phenomenon, whereby a solution of it becomes redder as its concentration increases, illustrates, also, the important fact which has just been mentioned, but of which, as it has already been said, Mr. Paterson has omitted to speak. It may, therefore, be used to explain, in a very simple manner—as will be seen—all the changes of coloration due to differences of concentration.

A solution of litmus in water, whatever its concentration, shows, when it is optically analyzed, a predominating red coloration. Litmus is, therefore, in reality, a red and not a blue or violet coloring matter.

In the diagram of Fig. 2 each of the various curves represents the optical analysis by the Toussaint (T.C.B.) photo-colorimeter (See Fig. 1.) of a solution of litmus in water at the concentration marked alongside it. It may be recalled that a color curve, obtained by the use of the T.C.B. photo colorimeter, is determined by ordinates giving the value, or intensity, as a percentage of a definite stand-

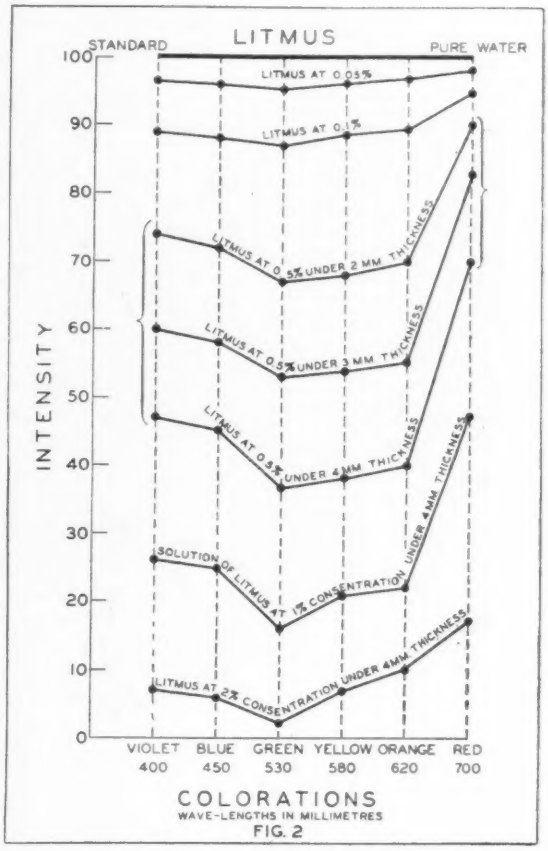


FIG. 2

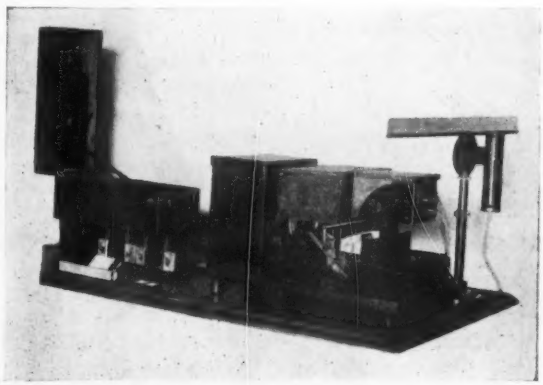
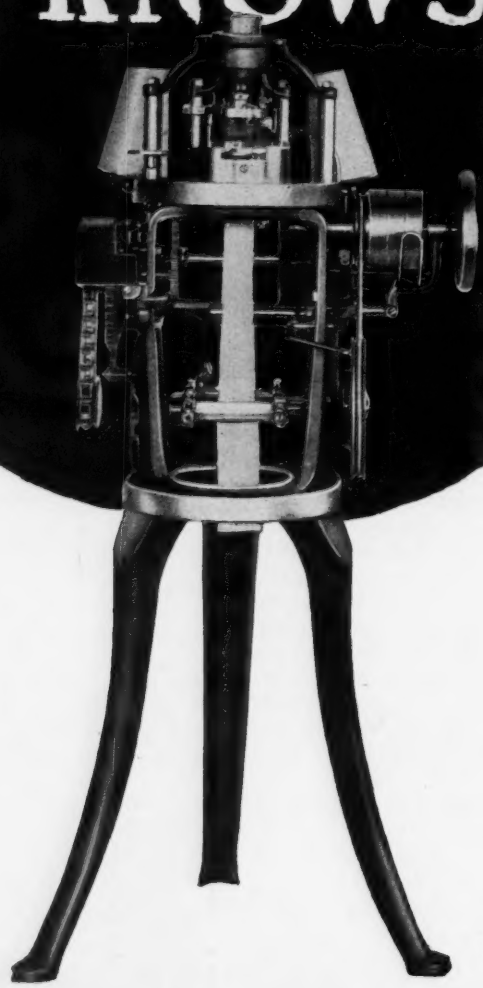


Fig. 1. The Toussaint (T.C.B.) Photo-Colorimeter Set. For a More Complete Description See COTTON for August, 1927.

anyone who compares- KNOWS



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ard—generally white—of the violet, blue, green, orange and red radiations, measured in wave-lengths, which enter into the composition of the color the curve represents.

The curves given in the diagram are the color curves of different concentrations of litmus solution, pure water being itself taken as a standard of reference and represented as the 100 standard line. The various curves, therefore, give a pictorial representation of the optical composition of litmus solution as its concentration gradually increases from concentration *zero* (pure water) to concentration *infinity* (absolute black, denoted by *zero* base line).

An examination of the curves comprised between these two extreme limits shows that, at all concentrations, the predominating radiation is red and that, if, starting from the uppermost one, we consider them in succession, the different curves, at first, show an increasing "distortion" as the concentration increases, but that, after a maximum distortion has been reached, the curves tend, more and more to flatten out, while keeping a high peak in its predominating (i.e. red) coloration and a low peak in the complementary (i.e. green) coloration, and to get nearer to the minimum of luminosity in all the radiations—i.e. to the limiting straight-line *zero*, or *infinite* concentration (absolute black).

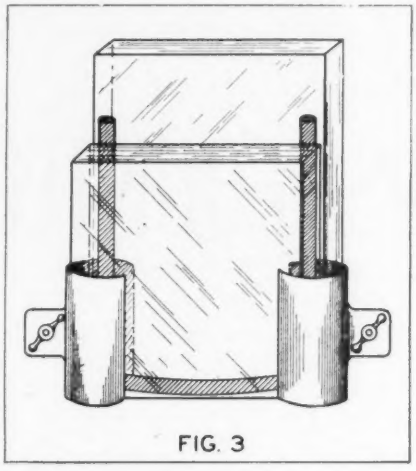


FIG. 3

Sketch of Liquid Specimen Containers. The Liquid is Held in the Space Between the Glass Plates Which are Clamped Together With a Rubber Strip Between.

Of course the "distortion" indicates, in each case, the maximum optical percentage difference between the predominating radiation and its complementary; and experiment shows that, in the case of any solution, the maximum discoloration generally occurs in the neighborhood of an intensity of 75 per cent of white for the predominating radiation.

With litmus solution the maximum difference between red and green is 36 and occurs when the solution, at a concentration of 0.5 gr. of litmus in 100 gr. of water, is examined in transmitted light through a thickness of liquid of 4 mm.

The difference between the red and the blue radiations is, also, a maximum for that same concentration. Consequently, a litmus solution will appear more and more red —or less and less blue—as the concentration increases from *zero* (pure water) to 0.5 and then it will appear less and less red—or more and more blue—beyond the 0.5 concentration until the point when it will appear black.

In the tests, the result of which are recorded in the diagram (Fig. 2) the concentration and, what comes to the same thing, the depth of the liquid layer (measure of the transmitted light) were, in turn, varied in order to reproduce the exact conditions of the experiment cited by Mr. Paterson.

The liquid specimen holders, with which the Toussaint (T.C.B.) photo-colorimetric set is provided, facilitate very much the carrying out of such tests. Each of these ingenious liquid specimen holders (See sketch Fig. 3.) consists of two glass plates which are placed each against one of the faces of a V-shaped rubber pad and against which

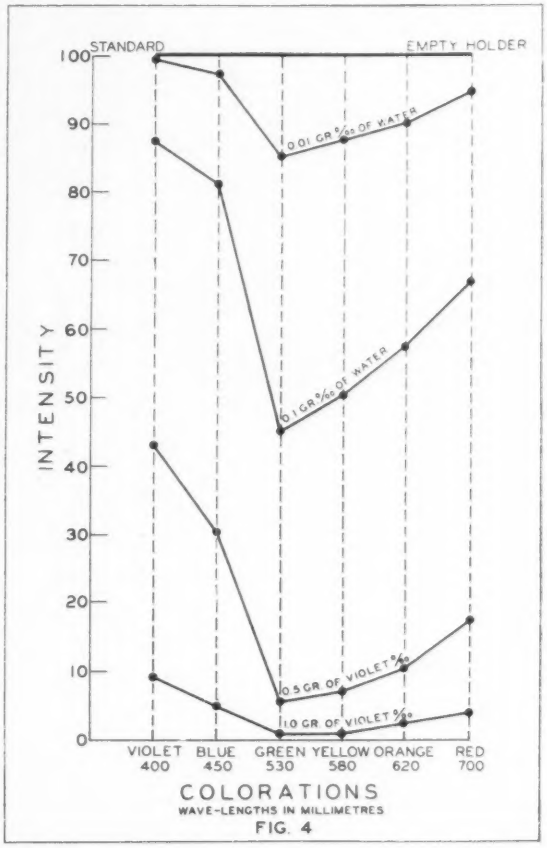
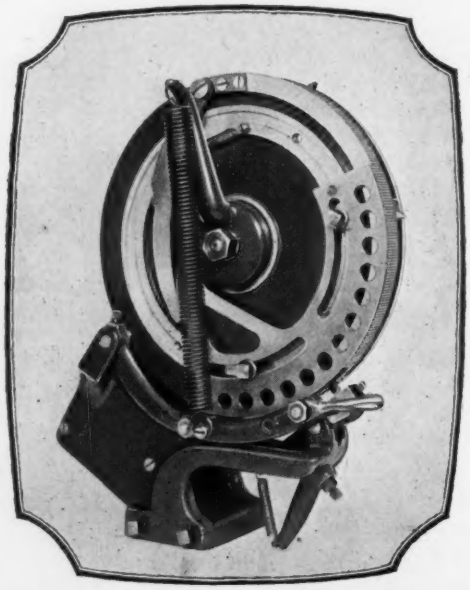


FIG. 4

they are held tight in position by screw-clamps. The arrangement, therefore, constitutes a water-tight holder the thickness of which may be altered millimeter by milimeter. The cleansing of such a holder is, in addition, easily done, since it suffices to unscrew the clamps, take apart the glass plates and the rubber which may then be thoroughly and quickly washed.

It seems to the writer that the explanation which is here given, graphically, of the different color appearances of litmus solutions is much simpler than the one based on the theory of color absorption which is given by Mr. Paterson. Besides, it explains fully—and not partly—all the color changes from concentration *zero* (pure water) to concentration *infinity* (absolute black).

Such an explanation based on optical analysis is, in addition, general and not peculiar to litmus. Thus, a fur-



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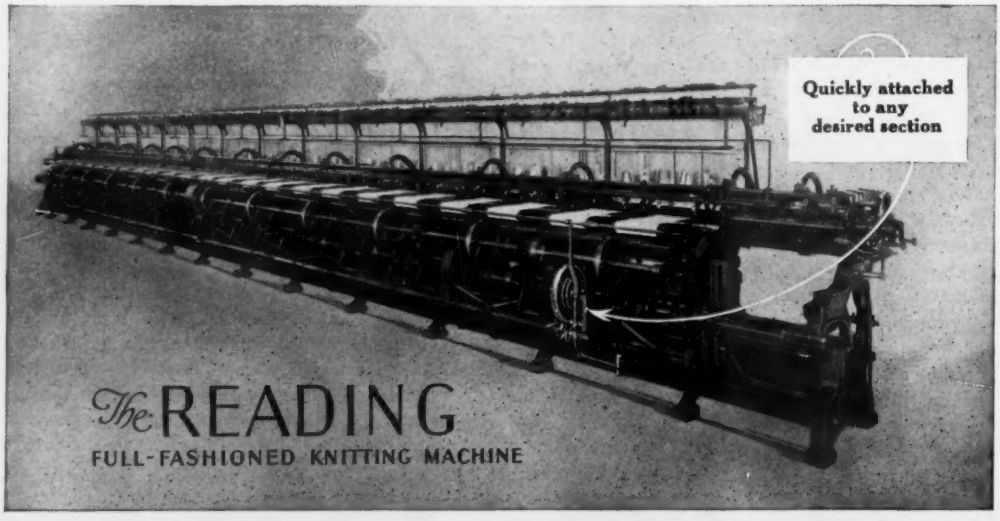


ther illustration of the phenomenon is afforded by the curves of Fig. 4 which represent, graphically, the optical composition of solutions at various concentrations, of a violet diazol. The concentrations, represented by the curves between the two horizontals *100* and *zero*, are solutions of 0.01, 0.1, 0.5 and 1.0 gram respectively, of the violet diazol in 100 grams of water. Here, again, we notice an increase of the deformation of the curves with an increase of the concentration until a maximum deformation is reached and, then, as the concentration is further increased there is a flattening out of the curves which tend, more and more, towards the *zero* horizontal line.

From such uniform behavior of solutions when subjected to an optical analysis, a conclusion of great practical interest to the dyer may be deduced. Indeed, if the purity of a dyestuff be defined as what it really is, that is as the intensity difference between its predominating and its complementary colorations, we may enunciate the following proposition or law:

The apparent purity of a dyestuff varies with its concentration; and it passes through a maximum which always corresponds to the same intensity of its predominating coloration.

If this *law*, which is capable of many immediate practical applications, was better known to dyers; and if the latter decided to make, once for all, optical analyses of the dyestuffs they use—which are not, in reality, very numerous—there would be fewer surprises in the tinctorial art. There would be none at all if the eye, with its defects and the illusions it creates, were entirely eliminated in dealing with color-matching problems.

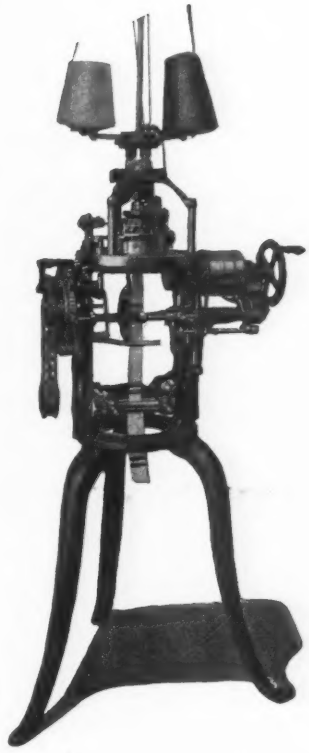
The Mutochrome.

The secret of the artist's influence on the decorative arts lies to some extent in his knowledge of successful color combinations, but in many cases, as for instance in the complicated patterns used in printed and woven textiles and wall papers even experienced men frequently fail to foresee the effect.

Where the possible variation of color combinations has to be worked out in the studio and the shop it frequently entails much work and expense in time and materials. By the use of the Mutochrome the evolution of color schemes may be judged without going to the trouble just outlined because of the following leading features of the device: First the design can be projected on a screen where it may be viewed simultaneously by a number of observers; second, each element of the design may be colored independently; third, the brightness of each element of the design may be altered independently. These features, together with the simplicity of the controls enable the operator to make variations in the color compositions of a design which would otherwise entail many hours of work on the part of the artist or workmen.

As an example of this, a design may consist of yellow flowers, light green leaves and a gray background, but by the use of the Mutochrome it is possible in a few seconds to try the effect of, say, red flowers, dark green leaves and a brown background. These changes may be worked out in an infinite number of variations made possible by the alteration of the brightness of each color used.

The Mutochrome is made in four designs suitable for 7, 10, 17 and 25 colors. This device is manufactured by Adam Hilger, Ltd., 24 Rochester Place, Camden Road, London, N. W. 1, England.



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Assembled from parts infinitely precise in craftmanship; adaptable because they must meet versatile and individual requirements; Atwood equipment has received the unanimous approval of both Silk and Rayon manufacturers. Atwood is proud to serve these industries and fully prepared to give a rich measure of helpful service. *Detailed information on request.*

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Manufacturing Full-Fashioned Hosiery Against Costs

Eliminate Excessive Overhead, Seconds and Waste. It is Only Through Observation, Study and Watchfulness That Success Can be Attained

By C. H. BAXTER.

When we speak of manufacturing against costs in the full-fashioned hosiery industry, or in fact any manufacturing industry, this can be summed up into one word, namely, "Economy".

With the competition that prevails to-day, and the public continually demanding lower prices, the only way that a manufacturer can possibly be successful is by using the most economical methods possible, so that the product can be sold at the market prices and at the same time give him a fair profit.

In manufacturing hosiery or any other article, one cannot expect to have the labor be economical. Labor, generally because of the lack of knowledge and inexperience, will only produce the easiest way, and the matter of waste of material, supplies or any thing else used in connection with manufacturing hosiery is something that the operatives do not feel concerns them, as they do not have to pay for it and hence do not understand the necessity of being economical in such matters. So it is really up to the superintendent and his assistants to find ways and means of manufacturing economically. It is up to them to see that the labor is not wasteful.

The greatest cost item in connection with the manufacturing of full-fashioned hosiery is the material. This is one item that must be watched very carefully so that the amount of material used does not exceed the amount needed per dozen, as is required according to the cost established.

The first thing that must be watched is the matter of buying materials, especially silk. The prices of materials fluctuate so that it is necessary to watch the markets closely and buy when one feels that the right time has arrived for buying. Buying materials is more or less of a gamble and no one can really tell another just when it is safe to buy.

In order that I may give information as to the various methods one may use in connection with manufacturing against costs, I will take each operation in manufacturing full-fashioned hosiery from winding to the final examination.

The first operation is the winding of materials. In this operation it is principally a question of waste, and in cone winding, to see that the cones are wound properly so as not to cause any trouble in the knitting operation. The winder should be taught and watched to see every possible yard of material is wound. All waste should be kept in some kind of a box, bag or container and weighed each week to determine how much waste has been made against the total number of pounds wound.

After the cones are wound, they are given to the knitter. This is really where the manufacturing against costs begins. It is surprising how many plants merely keep giving the material to the knitter as fast as it is needed and do not have any check as to whether more material than what is needed according to cost weight is being used.

The best method I have found in connection with checking and finding out if the amount of material given to any one employee operating a knitting machine is making the required number of dozens, as per cost weights, is as follows:

Some racks or bins should be built, the number of these required depending on the total number of knitting machines in a plant. One bin should be built for each machine and these bins are used to hold the material that is to be allotted and used for the particular style that the machine is making. These racks or bins should be placed somewhere near the winding department.

As an illustration to show the uses of this rack or bin arrangement and its purposes, let us say that machine No. 1 Legger is going to make Style 80, an eight-thread number, and instructions are given out for him to make 200 dozen. This number is made with eight strand silk, 50s/2 cotton in the welt and plaited with 80s/2 in splicing and heel. According to the cost weights, which will include waste, it takes one pound of silk per dozen, four ounces of 50s/2 cotton per dozen and two ounces of 80s/2 per dozen to make one dozen legs.

A duplicate of this order should be given the winding department and as soon as received there, 200 pounds of 8 thread silk, 50 pounds of 50s/2 and 25 pounds of 80s/2 should be placed into the No. 1 rack or bin. As the operator of machine No. 1 requires material, it is taken from the bin and given him until all of the material is used. When all the material has been used, it should have made 200 dozen as per order and if it does not make this amount of dozens, then either the cost weights are wrong or there has been an excessive waste of material. This is the best method one can use to manufacture against costs, as far as materials are concerned; as by using this method, one will always know whether the required number of dozens are being made with the amount of materials allotted. This method will require a card and order system, but this can be easily worked out to meet the requirements of any particular factory. Offhand it may seem that using this method means loss of production and requires one to have considerable material on hand at all times, but this is not the case, if this method of getting a check is operated properly.

This same method should be used in the footing operation as well as the legging operation, alloting to the footing machine the number of pounds of material that is required to make a certain number of dozens of feet.

In the topping and footing operation, the principal thing that must be watched is the number of legs that are being spoiled and cannot be used. One cause of spoilage is the unraveling of heels and this results in waste as there is a certain amount of waste created before it can be topped on the legging machine. One method to overcome this is to have the leggers clip off the corners of each heel above the loose course with the scissors. This prevents the heels from unraveling and means less legs spoiled.

Another thing that must be watched is that the footer before taking off a stocking that has been spoiled by poor topping or transferring, will knit a few courses, so that the topper can re-top the leg again.

Spoilage of legs is sometimes a large item of loss and this should be checked closely and reduced to a minimum.

During the legging, footing and topping operations, a careful inspection should be made at all times for flaws, menders, or irregularities to reduce the percentage of "seconds". One should watch that the legs are always made the proper length, as legs made too long need more material and legs made too short are usually called "seconds". Making seconds is costly and if the cost weights are figured on 10 per cent seconds and a mill is making 15 per cent seconds, this is not operating at a profit. I have always found it economy to have all legs and feet examined by competent examiners, as this gives the person in charge of the knitting operations, a check on workmanship and reduces the danger of too many "seconds" being made. Bad legs can always be re-drawn and rewound, whereas when once the goods are looped and seamed it is costly to do this work.

In looping the principal thing to watch is menders, and the looping should be examined at all times for bad work made because the looper did not put the stitches on the points properly.

In the seaming operation, one must watch to see that the seaming is done properly so not to cause "seconds". The welts must be seamed evenly and the most important is to have the splicing seamed evenly as this is what will always make a second, after the goods are dyed, if not done properly. It is well to have the examiner on grey goods watch this closely and all such work should be re-seamed without cost to the manufacturer.

In examining and turning grey goods be sure to sort out the stockings and keep clean stockings separate from soiled or oily stockings. For light colors, clean stockings should be used and use the soiled or oily stockings for dark colors or shades. By doing this, it reduces the number of re-dyes and this saves considerable money as re-dyes mean more "seconds" as well as additional labor charges.

The boarding operation should be watched to see that all hosiery is finished properly so to prevent too many so-called re-boards, which usually means an additional labor charge.

In the final examination of dyed hosiery, this is one operation where the operator should be carefully trained. Lots of hosiery should be checked continually, even though they have been examined by each operator, to see if the first quality hose examined are really first quality and do not contain "seconds". The "seconds" thrown out by the examiner should also be examined again to see if they are really "seconds".

Finally we come to overhead and supplies. In overhead one must take production in consideration first. If the cost has been based on an average weekly of production of we will say 1000 dozen and then the manufacturing is such that only 900 dozen per week are produced, this will naturally increase the overhead. Production is entirely up to the superintendent and his various assistants, and during the course of any working day this must be constantly watched. Idle machinery does not produce and as soon as a machine is idle for any cause whatsoever, see that it is started as soon as possible. Do not let production fall as any plant must at all times have production to operate profitably.

Supples must be watched to see that they are not wasted and only necessary supplies should be purchased. Take care of all supplies in use and see that they are used in an economical way.

Watch at all times that there is no unnecessary labor employed that will increase the overhead. Check continually all labor on day rates and see if they are actually doing the amount of labor required in order to be within the amount allotted according to costs.

Watch such items as light, power, and water, repairs and replacements and see that these items are kept down to a minimum. In fact, constantly be guarded against any rise in overhead expenses as this is one place where, because of laxness and no thought, the profits are sometimes wiped out.

The successful manufacturer of today is the one, who is operating his plant economically and has in his employ assistants who are interested in seeing things done economically. To operate economically it is absolutely necessary to continually watch for losses that might occur.

The successful superintendent or foreman is the one who operates his department or mill economically and it is only through observation, study and watchfulness that success can be attained.

The things I have pointed out are the principal items of loss, if not watched carefully; but in every plant there are certain special conditions that must be studied. So at all times in studying conditions, base your thought and decisions on economy.

I can only sum up in a general way what is necessary to operate a full-fashioned hosiery plant successfully.

First. Get the largest production possible to reduce overhead.

Reduce waste of materials.

Reduce overhead as much as possible.

Make the finest quality possible, as after all it is the consuming public that you must please and if they are not pleased the product cannot be sold.

This summary is what the successful man uses as a basis and by watching carefully and constantly all items in connection with manufacturing, so that at no time does the manufacturing costs exceed the costs as figured, the mill cannot help but operate on a profitable basis.

The A B C of Dyeing.

(*Continued from page* 310.)

ton is not the same in all the goods in that lot. Cotton from different lots, or from different manufacturers may be in that lot and produce unexpected results. Sometimes cotton with a different degree of mercerization will dye uneven batches when thrown promiscuously in the same lot. And the dyer, in any of the above cases, is unable to get an even color on that lot. The only way in such cases is to let the lot go through, and let the pairer do the best he can, or select the good ones in the inspection room, and correct the faulty ones by themselves.

In the next installment I will explain further difficulties in matching with some dyes.

French Campbell with Fidelity.

French Campbell has become associated with the Fidelity Machine Company, 3908 Frankford Ave., Philadelphia, and will represent the company in Georgia, Alabama, and Tennessee. Mr. Campbell is well-known in the southern knitting industry, having handled yarns for knitters for a number of years. It is understood that he will continue to maintain headquarters in Chattanooga, Tenn.

The A B C of Dyeing

Matching Colors and Shades Under Varying Light and Weather Conditions Are Among the Important Qualifications a Successful Dyer Must Possess

By NOEL D. WHITE.

PART EIGHT.

To be able to match a given shade; to be able to duplicate the same shade day after day in lots of 10 pounds as in lots of 100 or 500 pounds, or any weight in between; to be able to do it by eyesight, because there are, to my knowledge, no instruments as yet devised to help measure the degree of accuracy in the matching of color in the dyehouse; to be able to match colors in the forenoon as well as in the afternoon; on clear, sunny days as well as on cloudy or rainy days from any window facing the north, or from any window that happens to be handiest to the dyer; and to be able to match colors in the night as well as in the daytime. These are qualifications a successful dyer must possess. These are stumbling blocks that throw many dyers by the wayside as inefficient, sometimes justly so and many times only because an otherwise excellent dyer simply did not happen to get in the good graces of his immediate superior who finds his matching faulty time after time.

Any dyer knows how easy it is to find faults with any match no matter how accurate it may be. Take, for instance, a compound shade, a shade made up of several dyestuffs. When the dyer has decided it is a good match to the pattern he has, and shows the result to someone else to get his opinion about it, he may be told that it is not the same color or that it is not an exact match. Both may be quite certain they are right, and they may each be right according to his vision. The fact is that they each see the color with a different eye. The dyer with his experience may decide that in spite of what the other fellow thinks about his match he is going to trust to his own judgment; while the other man will think the dyer does that because he does not know any better.

To illustrate this point better I will cite what happens here when we put in line a new or several new shades. In dyeing hosiery we have to change shades quite often to keep up with the styles. I am given a pair of stockings, or a piece of cloth, or a piece of leather, or anything to show the color wanted. Let us say I have a pair of stockings made in Paris, and knitted with colored yarn. Any dyer knows that silk yarn is dyed with different dyestuff than those used on piece goods, especially when the goods are made up with two or more fibers. In dyeing the silk in skeins only colors for silk are used, while we have to use colors for silk and colors for cotton because we use both fibers in all our goods. We go to work and dye according to our usual method, and get as near our pattern as we know how. If it is a very light shade there is not much color to see, and the matching is easy, the eyes of anybody can easily agree on that match; but let it be a nude or a grey, even if it takes no more than ¼ of 1 per cent of dyestuff, and there is sure to be trouble in agreeing on a good match.

The manager passes on all new shades, and decides when a shade is right in his way of seeing. I have found that his eyes see in a different light than mine, and this is how we manage: First I dye a stocking a match to suit my eye, then knowing that he sees more red in my shades than I do, I dye another stocking to a match considerably less in red and a trifle lighter, and I show him both shades telling him which is right in my opinion and let him decide. Sometimes we have to make half a dozen or more before one is selected to be the proper match for the new shade, but after that the rest is easy because after we have the pattern made with our dyestuffs in our way, the subsequent lots are dyed with our own formula always the same way, and the first and original pattern is forgotten. But we came to that after considerable argument. At first I did not realize we had such divergent points of view. It may be argued that when a match is good, everybody can see it; but I know now that is positively not so except when both are dyed in the same way with the same formula, and with the same dyestuffs, and even then if we take a stocking out of five different lots, dyed at five different times, matched as closely each time as it is possible for a dyer to do it, it is a safe bet that at least three of them will be picked out to be a little different. On one occasion when I was showing a match which I considered quite good, out of five men viewing it only one agreed with me; the others, all of them younger men found my match too red and too dark.

The reason for that I found out by reading an article which appeared in COTTON in the month of August, under the heading "Difficulties in Color Matching." It said that the lense of the eye often gradually assumes a yellowish tinge as age increases, and the slightest tinge of yellow light will upset the appearance of shades; and to my mind that explains the difference of opinion of the five men I mentioned above, four of them younger than the fifth man and myself.

What makes it hard for the dyer in some places is the custom they have in letting anybody criticise the matching passed on by the dyer. Let the boarders, the boss inspector, some one in the office or any one of a number pass his opinion on the matching, and the dyer will be in hot water all the time. The custom in big plants and in commission dyehouses is to let one man, an experienced man, known to be a good judge of color, inspect and pass on the matches at all times. In that way the dyer or dyers get acquainted with the way of seeing of that man and difficulties are reduced to a minimum.

In cases where no such man can be afforded, it is best to let the dyer himself be the judge. If the dyer can be trusted to run the dyehouse, he can surely be trusted to pass on his colors. It happens sometimes that a lot is not brought to a good match in short order, he has sought for a good match for a little time, and he knows that further punishing of that lot is not going to improve the material. He tries to get as near a match as to make it presentable, and before much damage is done he lets the color pass. Is it not better in a case like that to sacrifice a little on the shade than to injure the fiber?

I have known a man in a city in the East who was in

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In the hosiery business, too, the package is becoming an increasingly important sales factor. Manufacturers, selling agents and jobbers have learned from experience that fashionable hosiery sells faster when it *looks* fashionble—when it looks as fashionable in the box as on the foot.

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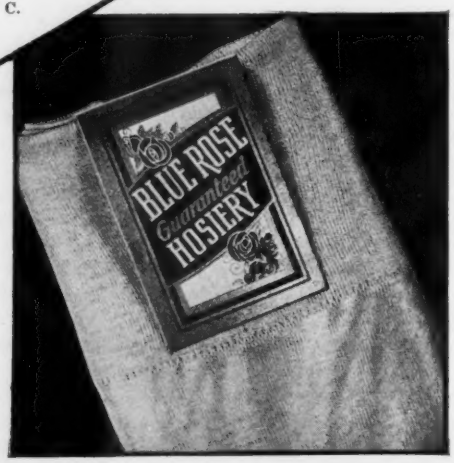

charge of a big dyehouse belonging to a large manufacturer of silk fabrics. All the dyeing was done in skeins. He had a dozen dyers working for him, and they all had to show him their colors before passing on them, and he would never pass a color unless it was touched up half a dozen times. He was showing them all that they did not know when a color was a good match. Those that stuck to their job, all developed such on inferiority complex that they were afraid to look for another place to work. I know of three or four who got that way; the rest, all very able dyers, left in a very short time. I lasted three weeks.

Many of this man's colors were rejected by the superintendent of the mill as bad matches the day after, and all of his work was complained of for the difficulty in winding. It was worked so long in the vats that it came out all tangled and fuzzy. He claimed it took time to get a good match. In my opinion he enjoyed showing the dyers how little they knew about matching. Many times he was shown the same shade again and again, the dyer having done nothing more than turn it a few times without any addition to the bath. Here there was nothing else to do but abide by his unreasonableness and lose confidence in one's self or quit; and this last is what all competent dyers did. Perhaps that is just what he wanted anyway.

On the other hand, a manager of another dye-house, where I used to work years ago, always insisted that the dyeing should be done in the shortest possible time for the best results. He used to tell me that the goods had to be worn out by the buyer and not by the dyer.

One of the difficulties in matching is found when a dyer tries to match a color dyed by someone else. Some shades are so complicated that it is very hard even for an expert to obtain a good match. He resorts to sunlight, shade light and artificial light. When he decides what to use, he proceeds to dye as near as he can to pattern and then he discovers that while the match is fairly good where he stands, from the light of another window it seems he has dyed a shade totally different. He may have used a green or a blue when he should have used a violet or an orange. In other words, he used something which was not in that combination, or he left out something which was indispensable. There are some dyestuffs that will show in a shade even in the smallest amount. If left out of the combination, no amount of skill will enable the dyer to obtain a good match.

The Rhodamines are some such dyes. They can be seen in any shade, and if the dyer attempts to match a pattern in which some of it has been used, unless he uses some of it too he will have a hard job matching it.

Many years ago when Rhodamine first came out, the writer happened to be employed in a dyehouse where it was adopted for the production of bright pink shades. The beauty, brightness and fiery fluorescence of that dyestuff was the admiration of all that first saw it. Also, the easy way it could be used. But, its many uses was yet to be demonstrated. The price was high so it was used only for pinks so far as I knew at that time. Some time later I left that dyehouse, and started working in another place. I was helping the boss, who was dyeing some silk that had to be used for weaving velvets. As anyone knows, in weaving velvet the warp is cut to produce the pile, and the shade is matched to a cut skein. On this occasion, this man was dyeing a lot of yellow, a bright color that looked very easy to match. I was helping him turn the skeins on sticks, and somehow the look on his face told me that he

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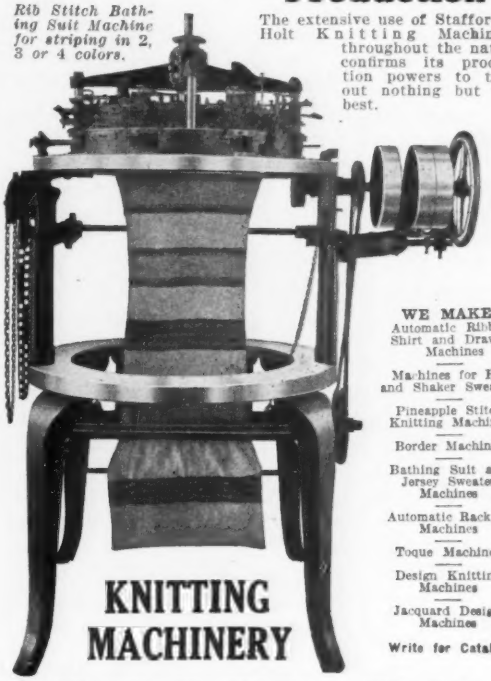

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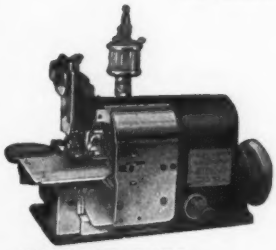

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had struck a snag. I inquired what was wrong, he showed me the match he was looking at and said: "Never in my life did I have such a hard time in matching a color". A color of that kind ordinarily was dyed with what was then called Indian Yellow and Orange. He thought it needed a drop of violet, and that had made it look flat, and his pattern looked much brighter in comparison. It had such a fiery undertone that the man was at a loss to understand. With all his experience, (and here was a dyer who had traveled much and was very skillful), he could not believe he was powerless to obtain a good match for that yellow. We stripped that color and tried again with no better results.

Of course, it was absurd on my part to venture any advice to such an experienced man as I knew him to be, but when I noticed that fiery hue, subdued by the yellow (which was the dominant color), my thoughts ran to the beautiful rhodamine I had seen used in the dyehouse I had left a short time before, and believing that possibly this man did not know yet of the existence of that dyestuff I mentioned to him what I had seen in the other place. He was quite interested, and asked me a lot of questions concerning its uses, which I answered the best I knew. He immediately sent for his dyestuff dealer and ordered some of the new dye. A dash of it instead of the orange brought up that shade with all the fire and brightness of his pattern. On the way home that night that man said: "It is a devilish delight all dyers indulge in, mixing dyestuff to mystify the brotherhood."

That statement I have often thought was only partially true. When a dyer is left to his devices to produce a new shade, he will try to make the best of his opportunity, but most follow a given route. In hosiery dyeing, except for the fancy pattern in half hose, shades are to follow the prevailing fashion, and a very few dyers can do as they please in creating new colors. For the most of us the best we can do is to try and make up our formulas in the easiest possible way.

In the days I mentioned above, the dyer had little access to trade literature and most of us cared little about it, consequently it was sometimes a long time before we learned of new dyes and that mostly by way of conversation. For the most part, however, any new way of processing was kept secret as long as possible. Most dyers who thought they knew something were apt to keep it guardedly as their private possession, and some of the old timers even today believe that his way is a closed book to any outsiders. But, with so many firms making and importing dyestuffs; so many salesmen introducing and selling them; so many textile papers and magazines advertising dyestuffs, no new dye can remain for very long outside the reach of a possible user.

One of the most important things to learn about a dyestuff is its behavior in drying on a hot board. Most any direct dye will change more or less, especially on the cotton. Experience and observation will teach the dyer how much the change is so he can make allowances when matching in the dyehouse. In some cases, the original color is restored on cooling down a short time and that makes it easy; but some dyes will not return to their proper shade so readily. The dyer must learn by experience to be able to judge how much change there is going to be on cooling down.

In every well appointed dye plant, the man in charge of the matching starts passing on the preceding day's work during the morning hours, that being the time the light is at its best and the room where that work is carried on is situated so as to have the full benefit of the light from the north. Of course, sometimes there is an occasional lot that has to be shipped as soon as possible, and some matching must be done in the inspection room at any time during the day, but that should be the exception, and not the regular thing.

In the hosiery mill, before a lot is permitted to leave the dye house to be boarded, a dozen or more stockings should be boarded, left for a time to cool down, and then inspected. In that way, if the match is not perfect and any imperfection in dyeing is found, it is detected and corrected before the lot is sent to the boarders.

Color matching in the dye house is the true test of the ability of the dyer. Sometimes a sample taken from a lot for matching is seen to be lighter than the pattern. A look at the bath will show at a glance whether an addition of dye is necessary, or simply a little longer time to more thoroughly exhaust the bath. Maybe a little salt, if no acid is used, or a little acid as the case may be. If the salt is needed, the temperature of the bath is of not much consequence; but if acid is needed the temperature should be no higher than from 150 degrees to 160 degrees F. Adding acid at a higher temperature the acid may rush the dye on the silk and uneven results may be the consequence. In case the bath happens to be too hot, before adding any acid some cold water may be added to the bath or the machine run a little longer to lower the temperature of the bath.

Sometimes the shade appears to be darker than the pattern, where as a matter of fact the only thing needed is to subdue the color a little. An experienced dyer will know at a glance whether he needs a little orange to subdue a fiery blue or a too bright green, or whether his color needs a little shaving off, but the beginner is very apt to become misled.

A little experimenting in the laboratory will teach him the power some dyestuffs have of taking the brightness out of the most ambitious dyestuffs. Make up a bath in a quart of boiling water, add to it one cg of Victoria Blue, or Green Crystal, or Wool Violet, add to it one c.c. of acetic acid and dye in it a swatch of knitted silk or a small skein. When dyed, wash and dry. Then repeat the performance, and add to any of the above one mg of Wool Orange, or Azo Yellow, or Fast Red, dye a similar swatch of silk, wash and dry. Now compare the two dyeings and see the difference between the one with the two dyes, and the one with only the blue, green or the violet. The beginner should repeat the experiments, using reduced amounts of the subduing dyes and learn how little of this can be used, and yet have a marked effect on the brighter color. The reverse would have the same effect. A bright yellow, an orange or a red, can be subdued by any of the first mentioned dyes, with a surprisingly small amount of it, and that is the best way I know to learn the effect of dyestuffs used with one another.

In some cases, the dyer is surprised at the result of his dyeing. The cotton shows a distinct contrasting difference, when he knows that everything has proceeded according to schedule. Before attempting to correct the color on the cotton, it is well to investigate if the whole lot is that way. A few stockings taken from different parts of the machine, dried and matched together may show that the cot-

(*Continued on page* 306.)

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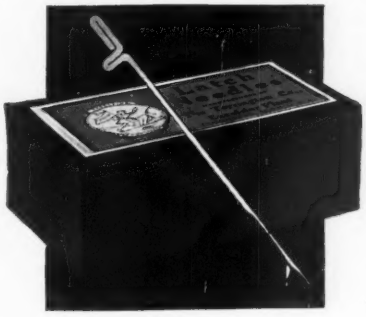

Next month, a further discussion of this problem.

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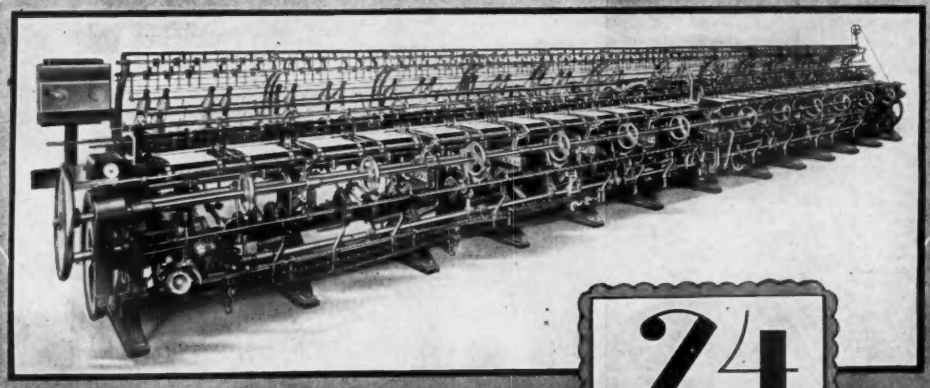

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EDITOR COTTON:

I have been reading the "Knitting Kinks" department of COTTON for about a year ,and get lots of good from it. Also, I have been helped by the "Knitting Kinks Handbook No. 1", covering the Scott & Williams Model K and Model R I machines, which I received as a premium with my subscription to COTTON.

While I have never written to "Knitting Kinks", I feel that someone should answer "Pete (N. C.)" whose letter on "Further Thoughts on Machine Fixing" appeared on page 90 in November. In this letter "Pete" criticized some of the points in the handbook referred to. I would suggest that readers get that issue and read his letter before going further with mine.

To start with, I want to say that I do not approve of some of the advice given in the handbook. However, "Pete" wants to be entirely too hard on the author of the book. I don't approve of "Pete's" way of criticizing, either. He referred to the days when he was fixing. From his letter I am sure he fixed on old model machines, when the machines were put up for one certain style of work, and the mills never changed them, for if he were fixer today at some first-class mill where all kinds of changes are being made, he would especially learn that the drum cams cannot be kept exactly as the machine makers send them out. He took exception to the statement in the book that if the shears cut off before the thread gets under them, the trouble is generally due to the shear drum cam being short.

"Pete" wants someone to tell him how a cast iron cam could wear down too short. Well, if he had about one thousand machines running continually he could easily see how it is done, and he could also see how the screws in the shear cams on the drum can become loose, allowing the cams to slip back to where the shear will not close in time.

He says he is now a superintendent, and I am only a head fixer in one of the best mills in the South, but he is different from all superintendents I ever heard of, for he seems to think if a cam or part is slightly worn or won't work easily, the proper thing to do is to junk it and get a new one. I think this is a very bad idea, for if a fixer can't take some defective or slightly worn parts and make them run, he is a "jackleg" sure enough, and should be called an assembler or flunky instead of a fixer, if he is compelled to have a new part every time anything happens.

In regard to concaving stitch cams, I will say also that 1/16th inch is too much. But "Pete's" bridge he told us about in the November issue almost gave away when he said that a few years ago jackleg fixers didn't know what concaving a stitch cam was. The trouble is they don't know yet how it is done properly. I do say that properly concaved stitch cams are a great help on some of the more complicated work we are making today, and will not cause broken cylinder walls.

JAKE (TENN.)

We invite our readers to make use of this departmentfor the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any partcular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

EDITOR COTTON:

Will you please allow me space to answer "Pete (N. C.)"? In the November number he made some criticisms of the booklet "Knitting Kinks Handbook No. 1", given as a premium with COTTON, and devoted to the Scott & Williams K and R I machines. "Pete" says that when his copy of the handbook arrived he started accumulating steam. Now, I don't agree with the author of the book about everything, but it seems as if "Pete" picked on the most simple things to let off his steam about.

He wants to know how come a shear cam made of cast-iron or steel can get longer or shorter when it has been running all right for months. The answer is, it doesn't. But it does get worn on the back side, and also it *can* become *loose*. The first condition would cause the shears to close before the yarn got in them; the second would let them remain open. The shears would stay open on all the yarn changes if the thrust bar or shears were binding.

Also, I want to say that all the new machines are not perfectly adjusted when they leave the shop. Most of them require a good bit of work before they will run perfectly.

Here's another rule with very few exceptions. When a fixer is always adjusting the drums on his section, there will be a lot of smashups on his job. It seems as if some near-fixers are obsessed with the idea that the cure for all the ills of a machine is to adjust the drums.

"Pete" seems to be steamed up over the switch cam bracket screw holes being filed so as to get better adjustment. We have a section on which this was done and the

machines are not always slipping away from the cylinder; neither do they smash up from this cause.

"Pete" next criticizes the adjustment of the switch cam as explained in the third chapter of the handbook. He says that whenever a switch cam becomes so worn that it does not transfer the medium butt needles, the only remedy is to put in a new switch cam. What a job this would be, to put in a new cam every time, if you had a lay-out of several hundred machines which had been running for two or three years. The switch cams of every machine would wear out to a certain extent—that is to be expected. This results in the switch cam not raising the medium needles. As a remedy, would it not be easier to tap the bracket in by loosening the screws? There is usually enough play in the screw-holes to get this adjustment. I have also used Mr. Miller's tipping method, as suggested in the book, that is, putting a piece of paper under the back of the switch cam bracket. I have done this to machines and they have run for long periods without causing any needle breaking trouble and broken walls, as "Pete" said would happen if the method were followed. I do not believe that many men would take "Pete's" advice on this, when looking at it from a practical standpoint.

He next goes on to say that a stitch cam that is concaved 1/16-inch is ruined. I disagree with him. I have charge of several hundred Model K machines, making all kinds of styles and running at a good rate of speed. There are many occasions when a machine cuts out in the gore or in various places and almost everything can be tried without results. The last solution of mine is concaving the stitch cam, which most generally works. The idea of the concaving is to relieve the strain on the stitch when it is being formed. I also believe that 1/16-inch would not cause broken walls or needles.

I hope "Pete" will not be offended by this comment, for I believe many of the suggestions offered in the handbook under discussion have proven profitable in both easier fixing and production. I know the same is true with others. I regret that "Pete" cannot see some good in the book, only criticism, which might have been suggestion.

CONTRIBUTOR No. 3026.

EDITOR COTTON:

I have been very much interested in the "Knitting Kinks" section of your magazine and have followed the many discussions therein. I read with added interest the letter from "Pete (N. C.)" in the November number in which he criticizes "Knitting Kinks Handbook No. 1". I wish to take issue with him because in my opinion he criticizes Mr. Miller, the author of the book, very wrongly. My experience with Scott & Williams machines covers a number of years, and since I secured my copy of the book as a premium with my subscription to COTTON, I have been benefitted very much, and have seen where it has helped many newcomers in the game. I agree with most all of Mr. Miller's explanations.

One thing that is needed badly in fixing hosiery machines is discussion of knitting facts, as exist in your "Knitting Kinks", which does its part, and could do more if more men would send in their ideas and questions.

"Pete" begins his criticism with the subject, "Shears Not Cutting Off at Yarn Change". I get the idea from his statement that a machine can run from the time it is received from the factory until it is done, without the shear cams getting off the least little bit. Considering the many changes made on a machine, including style and different other attachments, I have yet to find a machine that does not have a shear cam get out of adjustment. I also gather from "Pete's" remarks that the drum should be set ahead or back when a yarn change is not satisfactory. I disagree with him here. The only time a drum should be set ahead or back is when two or more yarn changes get off at the same time. If the drum is moved whenever a shear cam does not cut off, there will be trouble with the other changes of the machine—set-up, transfer and all such changes. So whenever one shear cam is off, my policy is to adjust that one cam and leave the rest as it is.

It looks like "Pete" is against nearly everything. He says that a few years back they didn't concave stitch cams. No, and they didn't send pictures by radio a few years back, but they do now!

I can't imagine a stitch cam concaved enough to break a wall in a cylinder. Perhaps "Pete" had better write again and tell us what he thinks a concaved stitch cam is. We have concaved stitch cams with the concave portions of varying depths and some that look worse than a concaved cam; and yet we do not have any unusual number of broken walls; the fact is we have very few, and there are about 750 machines in our mill.

S. M. (GA.)

EDITOR COTTON:

In reading the "Knitting Kinks" section in the November issue, I notice that "Pete (N.C.)" is shooting some pretty hard blows at the writer of the "Knitting Kink Handbook No. 1", criticizing some of the statements and suggestions therein.

The first thing "Pete" seems to want to know is during just what period of time does a shear drum cam wear out, or just when did it become too short. Now, assuming that "Pete" will admit that a stitch cam will wear out and become too short, I would like to ask him at just what time the cam becomes too short? If he can tell me at what time the stitch cam becomes too short, I will attempt to tell him at what time the shear drum cam becomes too short.

Drum cams and stitch cams, like all other wearing parts of a machine, do not wear out in a minute, but wear gradually until they are no longer fit for service, and then must be replaced with new ones. It should be borne in mind that there are many working parts on a Model K knitting machine which are constantly wearing and causing re-adjustment to become necessary. When the drum must be re-adjusted, which is not at all infrequent, then it is that the shear drum cams appear to be too long or too short, according to the direction the drum was moved, and must in some cases be replaced with new ones.

In regard to concaving stitch cams, I will admit that I have never found it necessary to concave one as much as 1/16-inch. Although I have concaved cams with good results to a depth of more than 1/64-inch.

With several years' experience on Model K and other machines, I find that each machine must be taken somewhat individually, that is, what will fix one machine might not have the same effect on another machine of the same make. So after all, fixing knitting machines is quite a proposition. It would be rather difficult to write any

set of rules on the subject which could be adhered to strictly.

I heartily agree with "Pete" in his objection to packing paper under the switch cam bracket. I do not approve of packing paper or anything else under any part of a machine. I consider this a bad practice to be avoided at all times. In the first place it shows poor mechanical ability on the part of the one doing the work, and in the second place the machines should be kept to a higher degree of efficiency to get the best results. After all, the author of "Knitting Kinks Handbook" is due a great deal of credit, for he has a host of good suggestions in his booklet, and while I might not want to carry out all of his suggestions to the letter, yet I find some valuable information in his articles.

"Pete" admits that he hasn't fixed for several years, and that is just what I thought when I started reading his article. If he will stop and reflect back over the time when he was fixing, he will no doubt call to mind the fact that he didn't know all about the machine he now presumes to know so well.

I have not fixed for quite a while myself, but I remember very well in the days I was fixing I ran onto many obstacles that taxed my ability to the limit. Yet there were other days when everything was running good, when I could stick my thumbs back into the arm-holes of my vest and throw my head back and strut up and down the alley and feel like I was about the best fixer there was. Now, if "Pete" feels at all times like he knows enough about a Model K to put out a better handbook than the one we have already, known as "Knitting Kinks Handbook No. 1", let him write her up and put her on the market. I'll take one. If he can't however, he ought not to criticize in the way he has the only man who has written one.

L. M. (TENN.)

To Prevent Back-Winding Silk.

EDITOR COTTON:

I thought I would report back to you regarding the question I asked and which you published in the May issue of "Knitting Kinks." I asked at the time for the practice of different mills in back-winding silk from full-fashioned bobbins; that is, was it better to run the yarn off the bobbin as far as is safe for the knitter, and back-wind the remainder with the resulting short ends and knots, or clear the bobbin to within about ¼ inch of the core and then back-wind.

I appreciate the several answers you published subsequently, and will outline what we have adopted in this connection.

Our problem, using the bare wooden cone or bobbin, was that if we back-wound with 20 or 30 yards left on the bobbin, when we started to knit this up a knot would appear that frequently in the yarn. We could not go down much more than that without having the yarn slough off over the top of the bobbin or cone.

Sometime ago I found that a number of mills were using a felt covering for the cones, and after trying some out I have adopted this. This is a covering of felt which is slipped on over the wooden cone. They originally came in light shades, but I had mine dyed a dark blue. They remain permanently on the cone. They keep the yarn from slipping, they help hold the moisture in the yarn, and the dark color permits the operator to see easily how far down the light colored yarn is running. We can now run the yarn down to within a foot of the end without any danger of sloughing off. CONTRIBUTOR NO. 242.

Preventing Long Loops on the Model K Machine.

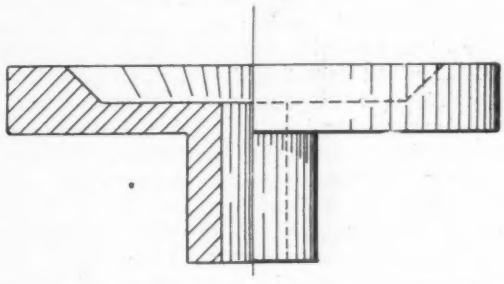
EDITOR COTTON:

The question of long loops with the fashion seam attachment on the Model K machine has been discussed at length in the columns of "Knitting Kinks", and I have watched the various suggestions for preventing them. In fact, a number of months ago, I asked through "Knitting Kinks" the question as to how to remedy them which started all of the original discussion on this subject.

Since we have successfully solved our problem in this connection, and since I appreciate the valuable suggestions offered by the men who answered my question, I am going to describe what we found was one of the biggest helps.

One of the things that aided us in reducing these long loops or "wooly-backs", as we call them, was to equip our machines with the new spring head which the machine manufacturers put out. Our machines are 3¾-inch gauge, 220-needle, making women's mercerized stockings.

The first thing we did was to send the dials to the machine makers to get them fixed for the fashion mark, and now I have a fixer who certainly knows how to set them. The first thing he does when they come back is to set them up true. If they are true they will set close and no yarn



can wind around and cause these long loops. He then takes a piece of emery cloth and polishes them off slick. Then he sees that every bit has the right tension and that the points are exactly right and come together. If this is done, I can guarantee that the long loops or "wooly-backs" will be reduced to a minimum.

In setting the dials and truing them up, our man uses the dial gauge which can be secured from the machine manufacturers, and which I am illustrating in the accompanying sketch. This is a simple affair, but it works wonders, and I can recommend this method highly. I think it is a solution to the problem. We are now using the fashion seam attachments with entire satisfaction. This gauge simply sets down on the dial post, and then the fixer goes about the truing up the work.

We have had a remarkable reduction in the amount of needles we use since using this gauge and since putting on the spring head. Our needle breakage now is less than one needle to the machine for every 24 hours operation—which I think is pretty good. Our seconds on 200-needle, 3¾-

inch work run around four per cent. I think that is all right, too.

T.S.(N.C.)

Experimental Work in Knitting Mills.

EDITOR COTTON:

In the June issue of COTTON, on page 846, appeared an article from "Contributor No. 431" discussing the need of an experimental department in knitting mills. This is a subject on which volumes could be written, but which your contributor endeavored to discuss in a very short space. The very generalization, yet restricted aspect of the situation is analogous to that of an efficiency expert who goes into an establishment with an idea of rectification, irrespective of cause, reason or tradition which usually results in bankruptcy for the concern. He has overlooked the facts that the majority of mills have been in the knitting business for years and have made money; that the reason for being in business is to make money; and that managements of mills usually have a very good reason for particular policies, which must be fairly efficient or they would not be able to continue in business.

Let us pause for a minute to analyze the term knitting mill, which was so generally used. This industry in itself means the manufacture of three district classes of fabric; namely, underwear, hosiery and novelties. (The latter covering anything else knitted.) Let us go a little further and subdivide each group to determine the needs for an experimental department for each.

Underwear of the knitted type has for generations consisted of plain knitted fabrics, mostly of cotton. However, in more recent years the rayon, pure silk and combination yarns have been used with very little variation from the plain ribbed or flat knitted stitch. Novelty stitches have had very little usage, except recently in the rayon type of ladies' underwear. The keen competition of the present market prohibits a manufacturer from selling garments of say, 2¼ pounds per dozen (ladies' vests) for the same price as the manufacturer who only puts in two pounds per dozen garments; which would be the situation if a fancy stitch were used. We therefore come to the point of the need for experimental work in the underwear mill. Surely not to make new machine attachments (the machinery builders business) for fancy fabrics; not to install more efficient production methods—that belongs to the superintendent unless the mill produces over a thousand dozen garments daily—a production man would then be employed. An experimental man is not needed for garment designs. That is a designer's responsibility. Nor is he needed for machinery maintenance. That belongs to a mechanic.

Since the hosiery division is composed of ladies' full-fashioned and circular, silk, cotton and mercerized; men's full-fashioned and circular, silk, cotton, mercerized, rayon and combinations known as "fancies"; infants', children's, boys', misses' and sport hose of all types and forms, the need for an experimentor would surely vary. As very nearly all the foregoing types are manufactured by mills specializing in the one particular class, there is very little experimental work to be done except in the novelty class of sport hose and "fancies". These types are continually changing in patterns and it is therefore necessary for the "wide awake" mills to be ever changing the patterns. It will be acknowledged that a designer could be also called an experimentor in this case. But let us look to the mill that can afford such a man. For instance, consider the smaller mills, of under 500 dozen pairs daily, whose small production does not permit (at 10 to 13 per cent profit) both a superintendent and a machine fixer or mechanic in addition to the owner or general manager. It therefore, falls to the man in charge of machine maintenance to "play" with new attachments and patterns in his spare time.

Further, while a mill of about 1000 pairs of hose daily can support both a superintendent and machine maintenance man, it cannot, under the present market condition, afford an auxiliary employee as an experimentor or designer. So it resolves itself into the fact that only the larger producing mills can afford such a member in their organization.

Now, let us look to the novelty class which includes bathing suits, sweaters and outerwear (circular and hand frames) and mufflers and neckties (circular and warp type). As all of these types of goods are dependent on change of styles or patterns, there is a constant demand for someone to be responsible for new designs. But how many mills manufacturing any of this merchandise can afford an extra person to do nothing but design or experiment, if the original "experimental author" prefers the word?

So in summing up the situation, only the prosperous and large manufacturers can afford the luxuries. Since the reason for being in business is to keep the cash drawer filled, the majority of the mills cannot see their way clear to add to their non-productive overhead by employing a designer or an experimentor.

The reason for your contributor's article is not quite obvious, but should his idea have been to stimulate efficiency or more modern methods in knitting mills, he would have rendered more real service to the mill owners in general if he had discussed various methods of mill maintenance.

CONTRIBUTOR NO. 766.

To Avoid Cut-Outs on the B-5.

EDITOR COTTON:

I will describe in this letter a very simple and easy method of avoiding a lot of cut-outs on the B-5 machine, in starting to knit after the machine has transferred. The B-5 machine is fitted with needle pressers on the older models and with a sliding finger on the newer machines, so that there is no lost motion in them, but when they are run for a long time the drum and other parts will become loose. With this lost motion in the drum, if the machine is turned until the latch ring goes down and starts to knitting, there will not be much trouble with cut-outs. But, the knitter will trip the belt shifter, and down goes the latch ring and the spring pulling on the latch ring, and the weight of it starting down with such force, and when it gets to a point just above the needle, prevents its stopping at the right place. Instead of being moved by the drum, it moves the drum.

That is the cause of a great amount of cutting out. My suggestion is to take a piece of soft pine wood, and cut a wedge 2 inches long and ¾ inch thick, and ⅞ inch

across at one end and 5/8 inch at the other, and drive it in from the back side between the machine frame and the drum, just over the gear that turns the drum, just tight enough to hold the drum tight. This will overcome a majority of the cut-outs, I believe.

Of course, it is necessary to have the needle pressers or sliding fingers adjusted properly, and the cam block must be going in so that the left stitch cam will come in against about the 20th last short needle. This loose drum will cause the cam block to come in at the wrong time.

This will also work fine on the Model K machine, to keep the drum from being kicked too far. This will stop breaking of the needle butts and bending cylinder walls.

I. W. (N. C.)

Causes of Crepe Effect on Silk Hose.

EDITOR COTTON:

Replying to "L.B.(N.C.)" as to the causes of a crepe appearance in the full-fashioned stocking, the two main causes, to my mind, would be either dry silk or an insufficient number of courses per inch, which would permit the yarn to have room to give this crepe appearance. Some people say that the amount of twist in the silk will have some affect of this kind, but I have been unable to agree with this belief.

"L.B." states that he is certain the cause is not from dry silk, so the only suggestion that I can offer is that he try increasing the number of courses per inch, insofar as this is practical in the class of goods he is making, to see whether this will help him.

You know of course, that this crepe appearance shows up in the seamless stocking as well as in the full-fashioned, and what we always did to prevent it there was to knit the stocking as tight as possible in the foot and ankle and proportion the leg off. We would tighten it until latches began to shear the yarn in the leg and foot and this would have a tendency to reduce the crepe. In the full-fashioned stocking foot the stitches are knit the same all the way down.

T. O (N. C.)

EDITOR COTTON:

"L.B.(N.C.)" is having difficulty on account of crepe lines or water marks in his full-fashioned chiffons, and it is much easier to tell him some of the causes than to tell him the remedies, for remedies have not been found that will eliminate this trouble entirely.

Distortion.

Not for the purpose of contradiction, but due to our own experience in this same difficulty, I am inclined to the belief that a closer scrutiny of the fabric in the gray would reveal these crepe lines in the form of short lengths of looser course, this in turn showing under the glass the zig-zag stitch that in the finished goods catches the light and reflects it in a different direction, causing the appearance or effect of a water mark or crepe line. This light deflection can be demonstrated by stretching the finished fabric, causing the crepe line to almost disappear; then the tension being released, the line returns, due to the loop regaining the zig-zag form that was knitted into it, and all the boil-off and finish available will not take these distorted loops out. Stretching on the boards will reduce the crepe, but will spoil the appearance and feel of the whole.

Boarding.

Crepe spots, or groups of crepe stitches in a mass, may be caused in chiffons by distortion when being boarded, through careless and hurried slipping of the thumbs and fingers over the fabric while pulling on the boards. The silk portion should be handled as lightly as possible in order to avoid this.

Natural Silk Irregularity.

One of the causes of crepe lines is irregular harshness in the gum silk, and I think we are all aware of the fact that silk grading and filature reeling have fallen far below the standards of a few years ago. The irregularities found in the best grades of tram silk today were found only in the poorer grades of a decade ago. Harshness can be overcome to a great extent in the soak before throwing, but if there is irregularity in the natural filature there will be the same irregularity of softness and harshness all the way through the processing and knitting. Soaking makes the silk better to knit, but soaking will not even up extremes in softness and harshness as found in the gum silk of today, even in the best grades.

Winding.

As an ideal fabric depends upon an ideal yarn delivery to the sinkers and needles, so does an ideal yarn delivery depend upon an ideal winding system, the dream and hope of the knitter since the industry was founded, and as yet unrealized in spite of the elaborate claims made by winding equipment builders. If a bobbin winder is used the outside coils of thread become dry and more harsh than the inside coils; if a cone winder, the top and bottom coils are dryer than the inside coils and are more harsh. This difference in moisture may not be very noticeable, but in the pulling of the outside coils from the others the difference in moisture causes a little more drag due to slight stickiness. This in turn, creates a little more friction in passing through guides and carriers, and then in the forming of the loop and the dividing as the catch bar comes forward ,there will be some distortion of the loop that will not be taken out in any other part of the knockover motion. One point I will mention in passing is, that in the case of bobbin coils the crepe line will be longer but not so frequent, while in the coned coils it will be shorter and more frequent.

Softening of the thread in winding however, is not so important as regularity in quality of softness before the throwing operation. Let us also keep in mind the fact that while adjustments in machine motion may be made closer and tighter on service and heavy weight goods, these adjustments have to be made more delicately for chiffons due to the danger of cutting the fabric. This feature limits the fixer in applying tension through the dividing and knockover motion, one of the reasons why we see more crepe lines in chiffons than in goods of heavier weight.

Twist.

No matter how careful and particular we may be in handling the silk after it leaves the throwster, if the throwster has twisted the threads irregularly, three turns for thirty inches and five turns for six inches of every average yard, that irregularity in twist will positively cause distortion in knitting, and no amount of care in welting or winding, or tension in knitting will overcome it. This phase of the throwing operation is more prevalent than the throwsters will admit, and frequent tests for checking up on this irregularity are necessary for the purpose of keeping down the distortion caused by this fault. And put this

in your pipe and smoke it; the throwster will not tell you; you will have to tell him, and prove it, when the twist is unevenly distributed.

Takeup Device.

Some manufacturers are using a takeup device, similar to those used on seamless machines, as a brake to control the passing of the thread and to reduce vibration, but this will not prevent crepe lines due to distortion caused by irregularities in harshness and softness, or irregular moistening, or coil drag.

I hope a seed or two dropped here may germinate into some helpful solution of this trouble on chiffons. We are working in this direction and would like to hear from anyone who can help.

Ask the full-fashioned men to come on in and let's get together and attempt to solve this problem.

CONTRIBUTOR No. 902.

EDITOR COTTON:

This refers to the question you published in November "Knitting Kinks", signed "L.B.(N.C.)" and asking for the causes and remedies of a crepe appearance in full-fashioned hose. A sample stocking showing what he had in mind was submitted to me.

This complaint of crepe appearance is just another case of sleazy knitting.

Sleazy knitting in the knitting trade might be paralleled by cancer in the medical profession. There is more known about its results than it's cure. It is easily discussed but not readily corrected.

The primary cause of sleazy knitting is dry silk. The fact that silk is wet on the surface when introduced to the machine does not necessarily mean that silk is thoroughly moistened and mellowed at the time it is being knit. "L. B." says this trouble does not show up in the gray goods and is not very apparent in black, but is very noticeable in hose dyed in popular light shades. Let "L. B." carefully examine his goods in the gray and he will have no trouble in locating the difficulty just as visible in the gray goods as in the finished. Of course some of the lighter shades have a tendency to magnify the sleaziness, and black has some tendency to minimize it, but at the same time, under careful inspection he will find a uniform condition existing in all of his different colors.

For correcting the trouble we would suggest back-winding through any satisfactory knitting solution or emulsion, and rewrapping the cones with waxed paper and letting them age for not less than five hours before using, then pass over moistened wicks on the knitting machine. As a further precaution, we would check up on the adjustment of sinkers and see that there is not too much play between the butt of the sinker and the sinker head top plate, commonly known as the falling bar.

The proper adjustment for sinkers at this point is a thin sinker from the machine used as a gauge between the butts of the sinkers and the edge of the top plate while the striking jacks are in operation and have pushed the sinkers to the furtherest point forward. There are other adjustments that should be checked up on, such as the proper alignment of sinkers, proper alignment of needles, proper gauging of knocking over bits, sinker heads and slur cocks or sinker cams.

Finally, one of the most important things is to put in enough courses per inch to suit the gauge of the machine and the endage of silk being knitted. We judge "L.B.'s" sample to be six or seven thread and probably a 42 gauge machine. Under such conditions it will be pretty hard to make satisfactory fabric with less than forty-eight to fifty courses per inch. "L.B.'s" sample now counts around forty-two courses per inch, which indicates he has not put in more than forty-six per inch in the gray.

Another thing worthy of consideration is the proper speed of the machine. At this time there is kind of a speed craze sweeping the full-fashioned industry, and it is doing more harm than good in developing satisfactory production or quality. Let "L.B." moisten his silk as indicated and operate his machine around forty-five courses per minute just as an experiment and see if he does not wonderfully improve his fabric.

In addition to all the foregoing, it sometimes happens that the raw silk is of such a harsh nature that it refuses to be satisfactorily softened, making it almost impossible to absolutely eliminate all the trouble of sleazy knitting, which brings us back to the point of the trouble being more easily discussed than corrected, and indicates the necessity of changing silk when it is found to be of a harsh and wiry nature.

CONTRIBUTOR No. 3016.

EDITOR COTTON:

In the November number of COTTON, I notice that "L.B.(N.C.)" is having difficulty with a crepe appearance in his full-fashioned hosiery.

Let me say for this contributor's benefit that every manufacturer of dipped dyed hosiery is having more or less of this trouble, and while it is practically impossible to eliminate this entirely, there are various things that will cause this crepe appearance.

I note that "L.B." stated that it does not show up in the gray goods, but I am sure if he will closely examine the fabric he will notice that the stitch shows a slight unevenness across the fabric. Of course, after boiling off the gum the stitch is much wider or bigger and being soft silk after the gum has been boiled off, the stitch appears like crepe.

"L.B." seems certain that this is not caused by the silk being too dry. Dry silk is one of the causes for giving a crepe appearance, especially if the cone of silk is uneven in dampness on Universal winding cones. Uneven dampness occurs very frequently because the moisture will eventually work down to the bottom of the cone, leaving the top of the cone much drier. To overcome this one must see that the cones are moistened more at the top of the cone. Another cause is that the cone is wound too hard and when the thread of silk leaves the cone it sticks somewhat, causing the thread to drag. This stickiness is mostly at the top of the cone as the package is more compact at the top than at the bottom of the cone. To wind cones soft, use the least tension possible, and also wind what is called an open wind. On Universal winders the adjustment is on the drive pulley; this pulley being split so that it can be expanded. The expansion is done by turning the knob in the center of the drive pulley. Keep adjusting until the cone is winding so that there is one sixteenth of an inch between each layer of thread or silk.

Another cause for crepe appearance is not using the proper solution in the troughs over which the thread is wound. There are many preparations on the market for winding solutions, but my experience has been that most of them are unfit for use. The solution used for winding must

be such that it will not cause the silk to stick in the slightest degree, as stickiness of silk in the knitting process is one of the principal causes of a crepe appearance in full-fashioned hosiery.

Crepe appearance is also caused by the improper treatment of the silk by the throwster. To get the best results and overcome the trouble, the silk should be treated so that it is very pliable and at all times works smoothly on the needles. If the silk is not pliable, the result is that at times and at certain places in the stocking, it does not make a well formed stitch, and if one will look at the stitch through a magnifying glass, it will be seen that the stitch is not round but appears kinky.

The throwster is not always to blame for the treatment not being correct as another condition enters into this in the matter of raw silk.

Many times lots of raw silk will be bought that vary considerably as far as the hardness of gum is concerned, and when such is the case, more or less trouble is had in making a clear stitch on the knitting machine. The only good test I know for hardness of gum is to take a glass of lukewarm water and drop into it a small piece of silk, timing it as to the number of seconds it will take before it sinks to the bottom of the glass. The longer it takes to sink, the harder the gum is in the silk. Whenever a lot is received where the gum is exceptionaly hard, it is necessary during the knitting operation to see that the silk is extremely wet at all times on the cones.

Crepe appearance can also be caused by the knitting machine being out of adjustment. One thing, especially will cause crepe appearance, and that is having either too much or not enough play in the sinkers. A bind in the sinker head so that there is no play in the sinkers will always make a series of uneven stitches. When there is too much play in the sinkers, the sinkers will fly back and this will cause uneven stitches. Worn slur cocks are also a cause for uneven stitches. Striking jacks being too loose because of not having enough grease will cause the same trouble. Jack heads out of adjustment is another cause.

I can assure "L.B.(N.C.)" that he will never be able to eliminate crepe appearance entirely, but in order to reduce this to a minimum, I would recommend that the following things be looked after continually:

First. Get a good treated silk, that is pliable and does not stick to the needles. Second. See that cones are wound soft and that no stickiness occurs. Third. Keep silk as moist as possible and keep the moisture even on the cones. Fourth. Check at all times the mechanical points I have mentioned. Fifth. Be absolutely sure that the solution used for winding the silk is such that it penetrates into the silk and does not have a tendency of causing the silk to stick.

I am sure if "L.B." will work along these lines, he will find the fabric much improved and will get a very small percentage of hosiery, showing a crepe appearance.

C. H. B. (PENNA.)

New Bemberg Representative.

American Bemberg Corporation, with office at 180 Madison Avenue, New York City, announce that T. J. Porter & Sons, 119 South 4th Street, Philadelphia, Pa., now are their representatives for the distribution of "Bemberg" yarns in Pennsylvania, Western New Jersey, Maryland, Delaware and West Virginia. The Porter agency is well known, having been distributors of fine yarns throughout the country for twenty years.

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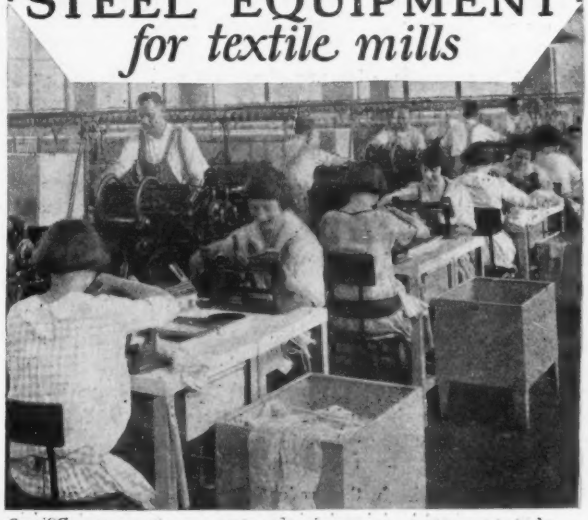


Lupton Bar Topping Tables and Work Boxes in use at Noe-Equl Hosiery Mills, Inc., Reading, Pa.

The Yarn Market

Philadelphia, Pa., December 15th, 1927.

In the cotton yarn market here very little of an extraordinary nature transpired during the four-weeks period preceding this date. General conditions remained practically the same as have existed for quite awhile, with a few more or less major developments. Nothing occurred, however ,to change materially the general outlook, which seems to be one of anticipation, waiting for measureable business at a profit, which seems to have passed up this market, to develop as a reality.

The first week of the month as reported here found some business being offered, but the bids were so low that it was necessary, in a number of cases, for the proferred business to be refused by those spinners on familiar terms with cost figures and without exceptionlly cheap cotton and other factors tending toward acceptance. It developed during the week that over-production was being attributed to a condition which really amounted to the diverting of quantities of yarn into the market by manufacturers who irregularly use their production and thus hold it off of the market. At periods of time when their own uses do not require the yarns, they are offered to other consumers, either direct or through the market, which adds pressure to the weight of stocks and available supply which does not aid in breaking down the buyers' resistance.

At the same time, it seemed certain that eventually there must come a release of the pent-up purchasing which has been held out of the market for some weeks. There is case after case where no commitment has been made for the new year, and spinners and dealers were hoping for a general break-down of the resistance.

The next week did not aid in clearing up the situation; in fact the pressure of the absence of buying, and apparent over-production in some lines, caused reductions, particularly in the carded counts for knitting purposes, where the parings amounted to between one-half and a cent a pound. This presented the paradoxical situation of having this quality of yarns correspondingly lower than comparable counts for weaving, this being the reverse of the usual condition.

There was some business, but most of it was for small lot orders for prompt delivery or for December delivery. It seemed that there had been too many spindles producing yarns. There continued a deadlocked situation, with a gap of about two cents, usually, between what the spinners desired for their merchandise and the price that the buyers were actively inclined to pay. It was pointed out that with the prices below replacement already, the spinners could not afford to take much further total reduction, except those who might be provided with especially cheap cotton; while on the other hand the buyers seemed content to secure available yarn at the lowest price to fill their own needs and not to commit themselves for yarns into the new year, into which they naturally wanted to enter with low inventory values in raw materials.

November ended, and December began, during this week, with still further reductions, due to a continued absence of health-giving business, and to a weakened position of cotton, which was used for bearing prices down. During this time mercerized counts joined company with the gray yarn on lower levels, but a hopeful sign was seen in movements toward closer cooperation between the mercerizers and spinners looking to the effect of a more harmonized activity with mutually profitable results. In the meantime, the attitude of yarn users is one of extreme caution if the amount of their commitments for the new year is used as a gauge of their sentiment.

Last week brought somewhat of a new feeling into the market. This was more or less intangible, but a general strengthening up throughout all factors could be felt. Carded yarns showed up better on the basis of higher cotton values, and, fundamentally, spinners took firmer stands about what yarns were worth to them. The Government's report, revealing a lower estimate than was anticipated, was considered bullish, but at the same time produced little effect in the market. The feature of the week was a hope for improvement, which seemed to be well-grounded.

The advent of this week found the market marking time with no major development one way or the other. Little active business is at present anticipated for the remainder of the year, but a pick-up is looked for after passing of the holidays and inventory seasons.

Philadelphia prices on December 15th follow:

Single Skeins.

4s to 8s	30½	10s	31
12s	31½	14s	32½
16s	33	20s	34½
24s	36½	26s	37½
30s	39		

Single Warps.

10s	31½	12s	32
14s	32½	16s	33½
20s	35	24s	38½
30s	40	40s	49

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	31½
8s and 9s tinged tubes	29
8s 3-4 hard twist waste	27

Two-Ply Skeins.

8s	31	10s	31½
12s	32	14s	33
16s	33½	20s	35
24s	37	26s	38½
30s	40	40s	48

Two-Ply Warps.

8s		10s	32½
12s	33½	14s	34
16s	34½	20s	35½ @36
24s	37½	26s	39
30s	40½ @41	40s	49

Frame Spun Carded Yarn on Cones.

8s	30	10s	30½
12s	31	14s	31½
16s	32½	18s	33
20s	33½	22s	34
24s	35½	26s	36½
30s	37½ @38	40s	46
30s double carded	40	30s tying in	36

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	45	20s	47 @48
24s	49	30s	52 @53
40s	56 @58	50s	65 @66
60s	70 @73	70s	80 @83
80s	90 @93		

Single Combed Peeler Yarn on Cones.

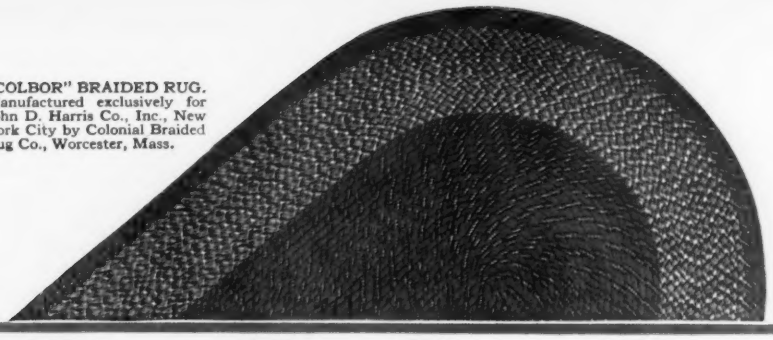
18s	44	24s	45
30s	51	36s	54
38s	55	40s	56 @57

Mule Spun Carded Yarn on Cones.

10s	36	12s	36½
14s	37	16s	37½
18s	38	20s	38½
24s	39½	26s	40
30s	42	40s	52

Mule Spun Combed Peeler Yarn on Cones.

10s	45	12s	46
14s	47	16s	48
18s	49	20s	50
22s	51	26s	53
28s	54	30s	59
36s	60	38s	61
40s	64		



"COLBOR" BRAIDED RUG. Manufactured exclusively for John D. Harris Co., Inc., New York City by Colonial Braided Rug Co., Worcester, Mass.

·COLOR·

The Master Salesman

A FRANKLIN PACKAGE of dyed yarn. It will deliver freely either rotating or over end.

THIS handsome rug is the product of the Colonial Braided Rug Company of Worcester, Mass. The structural idea is clever and original. But what really sells the rug? The COLORS!

Without color a fabric is flat, cold, uninteresting. Add color and it becomes a warm, living thing. It commands attention, creates interest and desire, and sells itself.

The yarns in this rug were colored by the Franklin Process Company, dyed and delivered in the convenient Franklin Package form, an excellent supply for winding to braider tubes or bobbins (or for warping in a creel).

The mechanical features of Franklin Process Service are highly important. Skeins and long chains are eliminated with their attendant waste and excessive handling costs. But the service does not end here. We also are prepared to assist in selecting color combinations for your product and to develop new shades in our laboratory, if you so desire.

Is COLOR selling for you? Are you making every possible use of this master salesman? Why not find out from "yarn dyeing headquarters" how COLOR can best be used in your product. Use the coupon NOW.

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Largest Job Dyers of Yarn in America
also Yarn Spinners, Manufacturers Glazed Yarns, Dyeing Machines

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CENTRAL FRANKLIN PROCESS COMPANY
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Commission Dyeing of Yarn in the Wound Form

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The possibility of increasing sales through the use of color interests us. Please mail us the complete story or have your representative call.

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Street .....

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State .....

Ad. No. 223. Printed in U. S. A.

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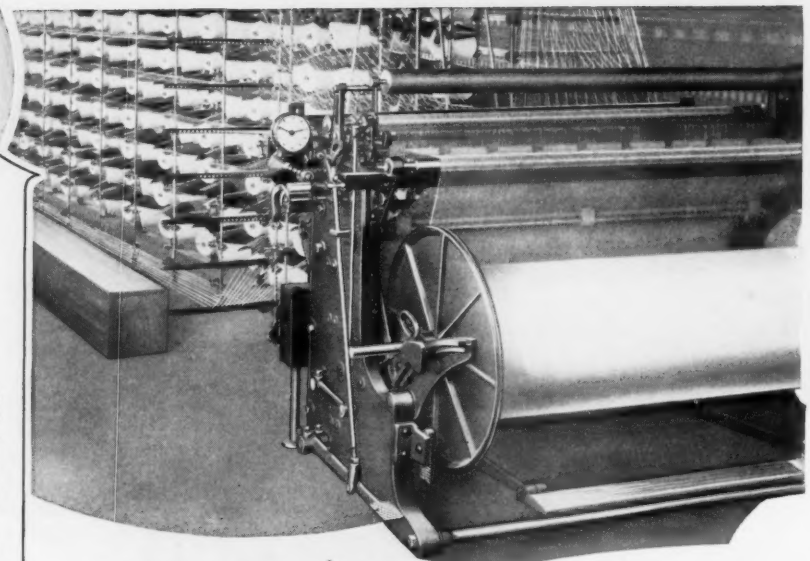
"The Solution of Every Winding Problem"

Two essentials to success in any business are a clearly defined target and an unwavering aim. A third of a century ago the Universal Winding Company established for itself, as a goal or target, "the solution of every winding problem."

Since then this Company has built over 2,000,000 winding spindles and marketed over fifty different kinds of winding machines. Many of the originals are still the only outstandingly successful mechanisms of their kind on the market.

This Company is at present the largest organization in the world making winding machines exclusively. Supremacy in size is the logical result of supremacy in demand. Supremacy in demand follows leadership in conception, execution, materials, and service.



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THE LEESONA warping system is a triumph of good marksmanship, the logical result of a steadfast purpose and determined, sustained effort.

The units necessary for this system, aside from a high speed warper, are the No. 60GF Leesona Universal cone winder and the Leesona Universal magazine cone creel.

The winder is of simple and sturdy construction, guaranteeing continuous performance at a sustained high winding speed. High speed, combined with a most convenient arrangement of supplies and quick threading tensions, make for the greatest spindle and operative production with the smallest amount of operative effort. The elimination of operative fatigue necessarily increases production.

By means of its magazine feature, the Leesona cone creel makes warping continuous, except when removing a full beam or when an end breaks. The cones of yarn from the 60GF high speed winder are placed on the creel in pairs, both pointing to a common tension device, the tail end of one being tied to the head end of the other. As soon as one cone is emptied it is replaced with a full one, and the head end of the new cone is tied to the tail end of its mate, or the live cone, while the warper is running.

Dead yarn, common to other methods, is ***entirely eliminated*** with this method of warping from a magazine creel.

Since the yarn in a "Universal" creel is drawn off over end from a stationary cone, there is no inertia or momentum to overcome, such as is encountered when warping from rotating supplies. Warping can, therefore, be maintained at a speed of 250 to 300 yards per minute.

Furthermore, slack and tight ends are eliminated as each end is tensionized uniformly in the magazine creel and, as there is no added strain on the yarn in starting from a stationary cone, it is obvious that better warps are obtained than from systems where revolving spools are used.

This improvement in warping is perceptible when doubling "Universal" warped beams at the slasher or when twisting from these beams.

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Ad. No. 2. Printed in U. S. A.

The Knit Goods Market

The steady day to day demand for silk hosiery during several weeks immediately preceding the holidays, the very conservative way in which retailers were replenishing stocks, and that the fact that mills were in many instances maintaining day and night operating schedules, evidences a lack of goods for immediate use at the dawn of the new year. Dealers were not prepared for the rush of shoppers when once temperatures descended to a seasonal level and bright days about equaled in number those when the consuming public found good excuse for remaining indoors. But it appeared the stores were one pace behind the consumer.

Manufacturer realization of the importance of being constantly on the spot for operating a 12-hour delivery service was illustrated in the announcement of a leading direct-to-retailer manufacturer that orders received Saturday night and on Sunday would be shipped out on the following Monday. It is understood in the trade that many of the city shops took advantage of the unusual offer and that parcel post shipments on several Mondays bulked big in the aggregate.

But activities of this character were not general. It was a peculiar situation, with numbers of the northern full-fashioned manufacturers deluged with orders and a greater number glad to extend January dating for spot goods. For these, the quiet which usually follows the holidays and is not unlooked for, blew in several weeks ahead of schedule. December sales were reported by some manufacturers as under those of the previous year. There was some consolation in the belief that as the lull had an earlier beginning, resumption of activities in 1928 would be advanced accordingly.

It is estimated by conservative primary market operators that not more than 60 per cent of the business for Spring had been placed to the middle of December. This seems a safe estimate as to children's hose and fancy half-hose, and probably is applicable to women's full-fashioned silk, as several of the larger Pennsylvania mills have sold for deliveries as late as June and others have written a fair volume of business for the early months. Much of the 1928 business is, however, simply on paper, but may be assumed to stick in the absence of untoward happenings of a character disturbing to commodity markets generally.

It is the jobbers who buy production that have been operating for distant deliveries. Those who simply trade on style are steady customers, like families just around the corner from a grocery shop who buy a day's meals and no more. Another class of buyers represents those looking for low price lots for so-called markdown sales during the post-holiday quiet. So, for the present there seems little danger of any great stock accumulation in mills.

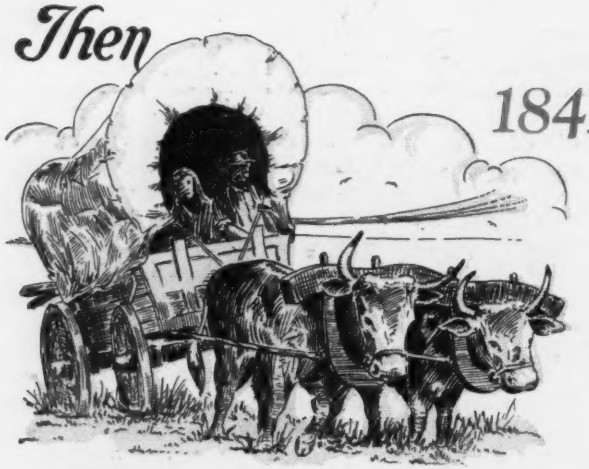
Although there is a decided trend in full-fashioned silk to finer gauge, buyers are out for low price goods. It is the contention of some important factors that the volume business is in lines to sell for $1.50 and lower, and manufacturers of lines in the higher price brackets admit this seems be the case. A satisfactory dollar full-fashioned silk for the chain store trade is the aim of more than one mill chief. Any retailer has available to him very high-grade dollar seamless distributed through jobbers. The chains want a dollar full-fashioned, and some are getting it, in 36-gauge six-thread hose. But there is so little of this that any small chain organization could readily absorb the entire output—and no one would think of installing 36-gauge machinery. For the present, dependence must rest upon 39-gauge mills whose managements are not too critical of their product.

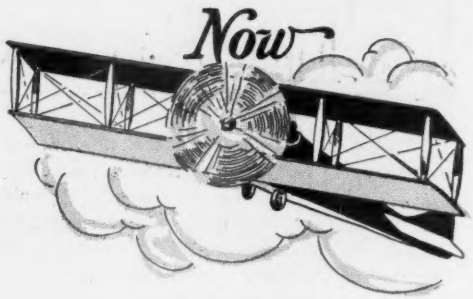
Demand for silk hose has been so well apportioned as between the low and high price goods that it seems difficult to say just where the advantage lies with mills. That there is ample of 42-gauge sheer service weight appears evidenced in the quotations of manufacturers, ranging from around $9.50 to more than $10 for comparable types. The 42 seems to be rated in the trade as an in-between stocking in matter of price. It is the popular gauge, and it is no secret that much hosiery that is knitted on 39-gauge machines is sold and accepted as 42. The Durham Hosiery Mills, recognizing this, is careful to specify in a circular to the trade that its 25-inch silk boot stocking, quoted $9.75 a dozen, actually is a product of 42-gauge machines, the circular drawing attention to the allegation that coarser goods are on the market under a misrepresentation.

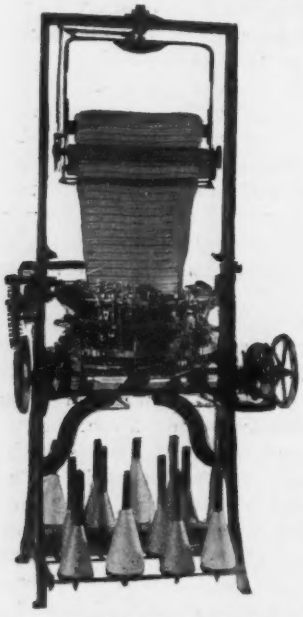
Some manufacturers of 45-gauge and finer favor putting a guarantee on their measure of fineness. The Traymore. Hosiery Mills, Reading, recently introducing a 48-gauge line, would be favorable to indelible marking of hose by gauge, it was stated by the president of the company. Leading buyers for department stores operating completely equipped hosiery departments say it is unnecessary and simply would lead to confusion. Women, they point out, care nothing for gauge so long as a stocking conforms to their ideas of style, appearance, average service and price, and it is held that the further sales people went into the technique the more would be the likelihood of confusing the shopper. It is up to the store hosiery buyer to know what he is selecting and take the best that he can offer within a given range of retail prices, say persons preferring to go along in the present old-fashioned way.

In full-fashioned silk there is good business for both fine and coarse gauge mills. Those which maintain the higher standards in their respective classes appear to be getting the greater part of it, and this is true also of seamless silk from both latch and spring needle equipment. In the latter class, a 260-needle stocking continues quite acceptable for the dollar price to a considerable element in distribution, while 300 latch needle hose is going strong, as the perhaps more popular dollar stocking in the latch needle division. But it is not of record that retailers ever found it necessary to describe seamless—or full fashioned—hose by the number of needles employed in the knitting.

Reports of more than 300 identical mills to the Department of Commerce indicate a decline in the production of women's seamless silk for the ten months to the end of October of approximately 15 per cent from the corresponding period of 1926. This falling off, considered with the







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lessened output of rayon hose in October as compared with that month of 1926, would appear to be accounted for in the gain of almost 20 per cent in production of full-fashioned, which is about the ratio for the two ten-months periods. The indicated falling off in rayon hose output in October was something over 40 per cent and in silk-and-rayon it was around 21 per cent, based on figures supplied by over 300 identical mills for 1927 and 1926. While these statistics supply an index of the trend, they doubtless would make a better showing for seamless interests if all manufacturers were embraced in the reports.

There appears a possibility full-fashioned production may undergo some curtailment in Philadelphia, by reason of a controversy with the organized workers. In advance of submission of the union's new scale to manufacturers, the latter said it would not be satisfactory, and that in any event the issue probably would have to be fought out on the open shop question. Since the Federal Knitting Mills declared for the non-union plan following a strike on a demand for time and half time pay for an extra hour per day, others are more encouraged in their stand for the open shop, which would permit one knitter operating two machines but would not bar union operatives from employment.

There now are four non-union mills in Philadelphia, one of them ranking well up among the larger establishments. An agency cooperating with manufacturers favoring the open shop predicted a few weeks ago that quite a few mills would make open declaration in January. As any move calculated to weaken the union would be stoutly resisted by that organization, it seems not improbable there will be some interruption of plant operation. That some of the larger jobbers scent trouble seems indicated in reported rather heavy contracting for deliveries through the first quarter of the year.

There is foreseen as one result of the pending controversy the establishing of small mills by organizations of a few experienced knitters. One such combination has taken quarters in Reading and is installing used machines acquired, it is stated, from a large New England concern. Four mills which are and for some time have been in successful operation were organized by idle union knitters immediately following the nine-months strike in 1921, and all maintain the open shop system. The active owners being experienced knitters, they have virtually an executive's income in their earnings as knitters and therefore have a low overhead cost. The present struggle may have a larger meaning than appears on the surface.

The attitude of small jobbers of hosiery in the matter of depending on mills to carry stocks for them is leading more manufacturers to look for chain store outlets for their product. "We need it to keep plants running," said a manufacturer selling to jobbers and chains, and this appears to be a common sentiment. A Philadelphia manufacturer of full-fashioned sold to retailers under the mill brand has established the second of a chain of retail shops and more are promised. On the other hand, the owner of a chain of four stores has abandoned all but one, on the ground rentals are excessive. The third to be let go was vacated in December. From which it appears that small, individual chains are not what they are cracked up to be. But changes in distribution are leaving an increasingly small slice of the business in hosiery to jobbers. This is true especially of women's full-fashioned, men's fancy half-hosiery and infants' socks.

Some jobbers say they will no longer carry infants' socks, that they have become more specifically a chain store proposition. This seems true in large measure of socks sold regularly for a quarter dollar a pair, the chain price being a nickel less. Except for the business placed by chains, trading in infants' socks for the 1928 season continues at a rather low stage. The larger jobbing houses have bought moderately, while many of the smaller ones have bought none. Conservative primary market factors estimated in December that distributors had provided for not more than 60 per cent of their average season's requirements. A southern mill reports 65 per cent of its production sold, much of it to chain stores.

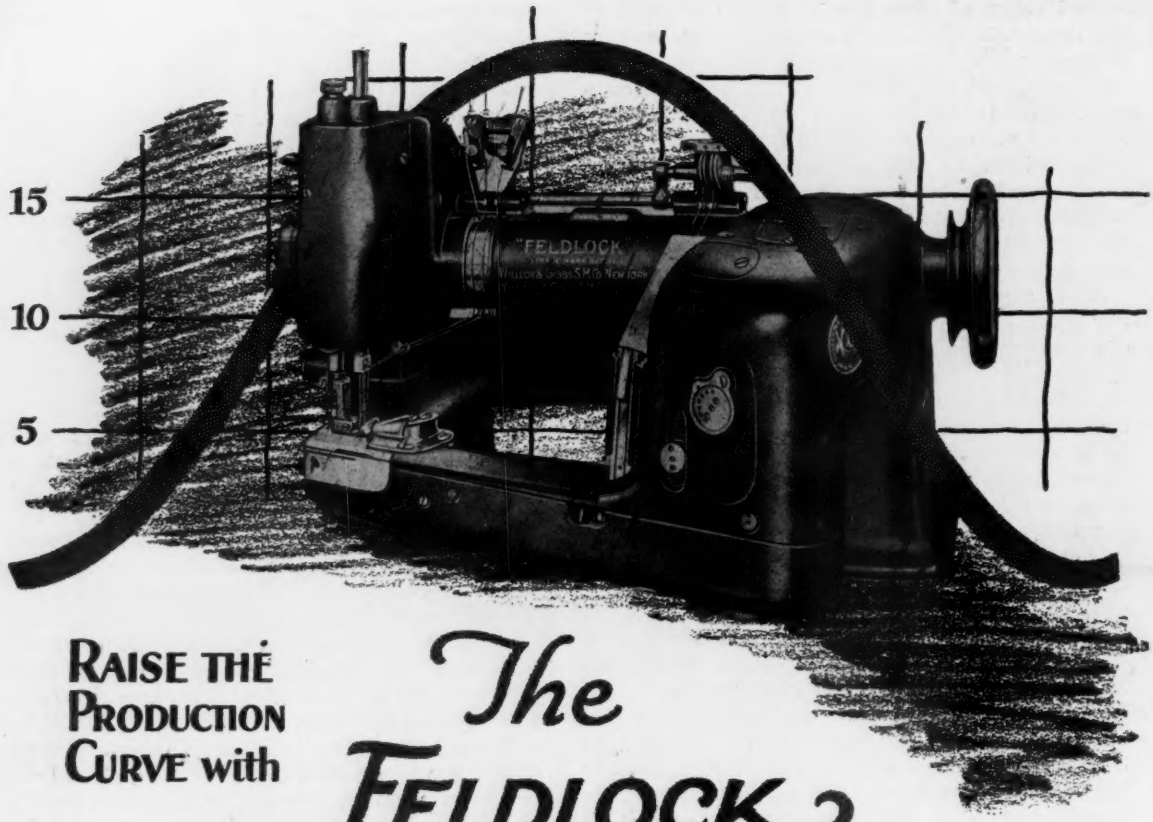
For escaping competition with chain stores, some manufacturers are considering the fashioned straight top for infants' socks, to sell for a half dollar a pair. A comparatively few mills are producing such a sock, and at least one, in Philadelphia, reports all the business it can take care of to the end of the season. Indications are that more manufacturers will turn to the fashioned top, which contemplates seaming the leg from the heel to the top.

Prices of cotton hosiery, after having been fairly steady for some time, became a trifle more uncertain following announcement of a proposed curtailment of production in the cotton cloth industries and, in sequence, the shaking up sustained by the raw fiber. An index price for children's staple hose was $1.40 for fine gauge combed ribs, the figure at which one of the more important southern manufacturers was selling, some for deliveries as late as June. There was a report this manufacturer had made a cut of a nickel a dozen, but this was found to be not true, and doubtless was a fiction of some supposedly clever buyer undertaking to play one mill against another. Such reports, regardless of their source, in conjunction with the slide in raw cotton, notwithstanding the lost ground was partly recovered, had the effect of making quotations appear less trustworthy. The rise on ribs is 7½ cents and the fall five cents.

Mercerized hosiery, for men and women, remains in slack demand, with no change in quotations. One manufacturer of women's mercerized says sales for his mill average around 10 cases a day. But this line is featured in construction and is practically in a class by itself, being therefore no criterion. Standard 220-needle hose, like men's mercerized socks, is only a very small item in hosiery distribution. There is an occasional spurt, but of short duration.

Wool hosiery of practically all descriptions has been on the market since the beginning of December for next Fall and Winter. Some little business in bundle wool half-hose has been placed, but not enough from which to draw a conclusion as to how jobbers regard prices. In boxed hose, for men, practically no orders have been taken, and the same is true as to women's and children's lines. Numbers of jobbers made it apparent immediately following the opening that they would not operate in even small degree until well along in January.

It seems a safe assertion that the liveliest item in hosiery is men's novelty half-hose. Enough business for Spring has been booked by leading mills to establish fancies for still another season, and it is indicated that the drift to higher price lines is making some headway. A mill in Reading, making lines to sell for a dollar to $1.50 a pair, is sold ahead for several months, and it is understood some others



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are equally well supplied with business in the more lofty lines. Another Reading mill, which always has operated in the field of half-dollar socks, has brought out two lines for 75 cents and a dollar a pair respectively. The dollar line is made with swiss embroidery clocks. A fancy sock mill in rural Pennsylvania, having an exceptionally low operating cost, last year increased its business in half-dollar fancies by 75 per cent over 1926, and contemplates enlarging the plant, say the management, as there seems assurance of a still further gain in sales .

A Pennsylvania manufacturer of novelty socks, of a smattering of rayon plaited on cotton, designed for the 25-cent price bracket, has discontinued the line, finding it unprofitable at $1.85 a dozen to jobbers. Demand for low end fancies is, apparently, on the increase, numbers of manufacturers being asked to put it in their lines. Makers of high grade 50-cent goods say they will not enter the quarter dollar field, since their lines give abundant satisfaction and sales are larger year by year, and they entertain the fear the low end output is likely to be overincreased.

Hosiery jobbers are talking lower prices for 1928, and manufacturers have their ear to the ground for the first sign of a break. There appears some uncertainty especially as to full-fashioned silk, jobbers sulking behind the allegation there is excess production and that output in 1928 will be increased, considerable new equipment having been installed in 1927, and more of it now being set up by small new establishments. On the other hand, it seems quite certain sales of full-fashioned are increasing in even greater proportion than the gain in population and new machinery.

More silk hosiery was sold and worn in 1927 than in any previous year, it is shown by trustworthy statistics. This is ascribed to the fact prices are at the lowest level since the troublous postwar period, and unless operating cost can be reduced, it would appear prices are as near the bottom as it would be safe for mills to put them. Raw silk, average for 1927, is lower by around two dollars a pound than in 1925, and recently has been holding fairly steady, after declining by a dollar a pound from the 1926 level. Unless there be lessened demand, it would therefore appear that a break in hosiery prices is not imminent. But factors realize they must reckon with mills that have not been getting their proportionate share of the business that has been passing recently, and what these establishments might do in a fit of desperation is past finding out until it is done.

Underwear.

The heavy weight underwear opening got away with a start that was satisfactory to the few manufacturers who openly announced prices for 1928, on November 28. The Standard Knitting Mills and the Appalachian Mills Co., Knoxville, Tenn., were the first to come on the market, and ten days later only three other mills, all southern establishments, were all that could be counted in the procession. Numbers of the Mohawk Valley and other northern manufacturers had strongly intimated they would not show their samples until after January 1, and it became apparent that there was much unanimity of sentiment in this respect, notwithstanding it developed in the course of a week or two that the prices of the mills which had opened proved satisfactory to a considerable element in the jobbing trade. Several southern mills which had made no an-

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nouncement of prices to the trade at large were known to be accepting some backdoor business, at prices conforming to those of mills which had submitted their lists.

"We have booked a very fair amount of business," it was stated by a person speaking for a Knoxville mill a week after the line had been on the market. "The orders are from scattered distributors, who evinced entire satisfaction with our prices for the first billing period, January to April inclusive. Sales exceeded our expectations."

Most manufacturers in the North had preferred that all defer the opening until after the end of the year. In the light of subsequent happenings, the advocates of a late date felt their attitude had been justified, for cotton sustained two jolts within ten days. The effect of the declines was to encourage holdback jobbers to adhere to their purpose to not operate until 1928. Some said they were waiting for 18-cent spot cotton. They put the argument that sales to retailers were very slow on the prices named in 1926 and could not be expected to improve on the 1927 higher quotations. But it appears manufacturers had priced their lines on cotton at about that figure.

Using a 10-pound two-piece suit of a southern mill for illustrating a point, the opening price in November 1926 was $4.62½ a dozen, based, admittedly, on 12-cent cotton. For the early 1928 period the price of this identical garment, from the same mill, is $5.25, a rise of 62½ cents, or a trifle more than six cents a pound for the cotton in the suit, without making allowance for waste in spinning and knitting, representing about the difference between 12- and 18-cent cotton. In any event, the opening prices for general lines are lower than the close for the current distribution season, now practically at the finish for mills. But buyers prefer to make comparisons with lower rather than with higher prices, and in conformity with this practice, ignore the fact that the present $5.25 garment was priced $7 in 1925 and maintained its place in the sales for that year. Obviously the December fluctuations in cotton supplied a species of vindication for the waiting jobbers, but it may be said that the price bogy was being overworked in seeking a pretext for deferring commitments for the first few months of 1928.

Now that all of the mills are offering their lines there is afforded opportunity for a survey of the outlook based on the amount of business placed. Prospects for a large volume in January are not as promising as they might be. Operating against promise of immediate activity are economic problems which may not be disposed of for another month or two. One question hinges on the ultimate effect of curtailment of cotton mill production, for effecting an adjustment of values through a better balance of demand and supply, a process which usually works out for betterment for industry in general. Following this short period of curtailment, prices for all cotton goods may be expected to remain stable for a reasonable length of time, and activity in underwear is to be looked for. Meanwhile uncertainty may prevail and buying for Fall proceed slowly. But the industry has gone through more trying periods than appears in the offing and weathered them successfully, so that it may be pretty difficult to cause manufacturers to become alarmed over distributor timidity.

Among the first of the northern mills to open for 1928 was the Sylvan Knitting Co., on the market about the middle of December, after two somewhat disturbing flur-

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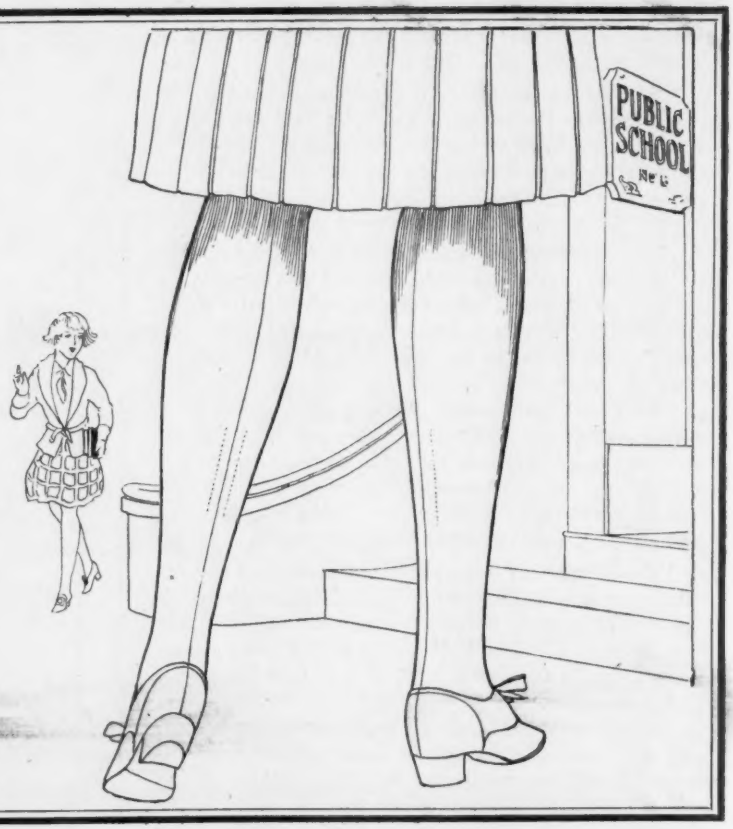

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ries in cotton. The company manufactures high-grade cotton ribbed union suits, and in the few years of its existence has built up a large and profitable following.

For the light weight season, manufacturers of knitted garments look for more of stressing style as a sales promoter. One leading mill is showing ribs in a variety of six stitches and many color combinations, and sales for 1928 are reported around $45,000 ahead of those for the 1927 season, to the end of December. This may not be a close criterion, as the mill in question is credited with distinctiveness in its lines and seldom is guided as to opening dates by what others may do. But it is obvious that conditions with this establishment are typical of those in numbers of mills.

With the styling of knitted light weight underwear, it is believed, nainsooks and kindred lines may not this year show such gains as have been scored. This is the opinion of some few manufacturers of the cut and sewn. Manufacturers of the knitted admit they were a long time waking up to the fact nainsooks were forging ahead year by year. Once they did realize this was the case, they arranged an advertising campaign, and the result is the knitted, in more varieties of construction, has recovered about all the ground that has been lost and promises further inroads this year on the cut-and-sewn. But not all the glory for the recovery belongs to the knitted interests, for nainsooks were hurt as a distinctive division by recourse to cheapening, by number of small concerns whose product was extensively exploited for what it was not. Skimping by this element proved harmful to legitimate manufacturers, and no one is better informed as to this than these latter manufacturers and legitimate jobbers.

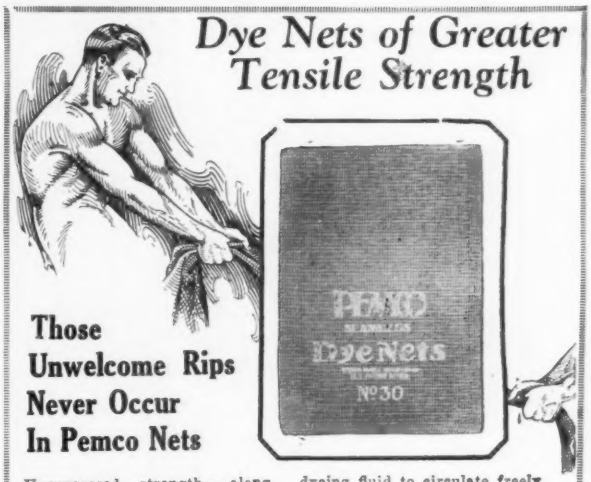
Sweaters.

Mill prices for sweaters are firming on advances in worsted yarns. For several weeks following the opening there were open allegations of cutthroat price competition, and it was held most of the business booked was being taken by manufacturers quoting under the market value as expressed in operating cost.

Mills were kept running steadily during the late months of the distribution season and are believed to have consumed about all of their low price yarns, which had cost them anywhere from $1.12½ to $1.20 a pound, basis of high quarter blood 2/20s. Recently a price of $1.25-7½ has been maintained, and about the middle of December spinners were getting $1.30 for standard yarns, and manufacturers buying into February. From which it is deduced they have been booking more business than at the outset and that price competition has come to a halt.

Sweaters having scored quite a comeback in 1926, there has developed among manufacturers a determination to expand in various units of the industry. This is seen in occupancy of larger quarters and installation of additional equipment. Last year was a good one for sweaters, and it is purposed to make 1928 a better one.

Selling for Spring has had a fair start, and some fall business has been booked, but hardly enough to indicate jobber attitude toward deliveries during the summer for the Fall retail season. Conditions have been draggy, but it is the general opinion there will be material improvement, now that worsted yarns look more like permanency as to price. The one dubious aspect relates to the carry-over stocks. If they be as heavy as some interests seem to



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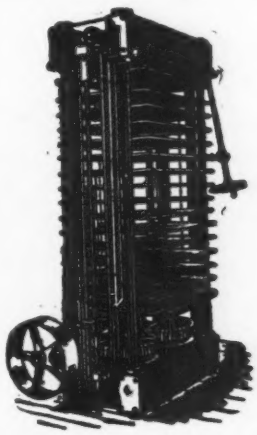

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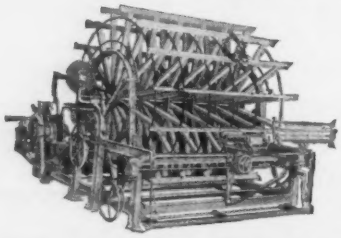

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believe, contracting for Fall doubtless will be deferred in no little extent, unless winter temperatures go low enough to strike a balance with the excesses of November and December. But style, in which there is much newness, should prove an incentive for early interest in the lines of the better established mills. Already it is being freely predicted that shakers in new collar models and sports coats will be the stronger items in staple coats.

Among the Knitting Mills.

A full-fashioned hosiery mill to be operated on, practically, the cooperative plan, is being set up in Reading, Pa. The new enterprise is incorporated under Pennsylvania laws, with a capital of $75,000, as the Pearl Hosiery Co. Except as to very small holdings, the stock is owned by a few full-fashioned expert knitters and Frank Henderson, a mill agent in New York, who is practically the only person other than craftsmen who is financially interested. The company was organized mainly through the efforts of Edwin Wilkinson, well known among northern mills as an experienced knitter. It will start with five Schubert & Salzer 45-gauge machines, to be in operation in January, knitting 4-thread silk with picot edge. It is stated the output has been sold in the gray to the end of March.

With the ratification of plans by the stockholders of the Glen Knitting Mills and the Brown-Phelps Hosiery Co., Philadelphia corporations, the companies will be merged into a new corporation, the Radmoor Mills, Inc., whose capital stock will consist of $75,000 cumulative participating seven per cent preferred, 10,000 shares of no par common stock and $500,000 6½ per cent convertible 15-year debentures. Stock will be offered to the public by Stevens & Co., Philadelphia and Reading, in units of one half share each of common and preferred stock and $100 of the debentures, for $200 per unit. Owners of shares in the two mills to be merged will exchange their stock for securities of the new company, and Thomas E. Brown, the controlling factor in each, is slated for chairman of the board of directors. According to information supplied by Mr. Brown, the Glen Knitting Co. has paid 175 per cent in cash dividends and 50 per cent stock dividends since 1903. As he owns more than 51 per cent of the stock of the two companies there seems no doubt the merger plan will be ratified.

About the time, several weeks ago, that announcement of the proposed merger was made there appeared in a Reading, Pa., newspaper an advertisement for "a young man capable of discharging the presidential duties of a $2,000,000 full fashioned hosiery mill with a 25-year record who could make a substantial investment in the corporation." It is understood the man being sought is for the presidency of the Radmoor Mills, Inc.

A manufacturer of women's full-fashioned hosiery in Canada is pushing stockings knitted for rights and lefts, with what measure of success has not been ascertained. Rights and lefts for women's full-fashioned hosiery were experimented with about ten years ago, by a concern in Muskegon, Mich., and it is authoritatively stated the experiment was abandoned after less than five cases of the stockings had been disposed of in one way and another.

An all-rayon full-fashioned stocking for women seems likely as a 1928 development. A well known mill has

A good team mate---

for your peroxide this year is "Star" Brand Silicate. It acts with quick efficiency and enables you to reduce costs. This, a popular economist predicts, will be the difference between success and failure in 1928. A trial will put you in the "satisfied users" class. Write to the Bleaching Division.

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We'll leave it to you whether or not these features of the American Overdriven Extractor aren't worth serious consideration:

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been experimenting with it for some time, and according to an executive, "the proposition looks good." It is maintained that the utility of rayon for hosiery has been proved in seamless goods and that all that is necessary to make it satisfactory in full-fashioned construction is to dispose of a few minor problems which are said to appear not difficult of solution. It would be a dollar stocking, it is stated.

Warwick Knitting Mills, of Brooklyn, N. Y., will remove its plant to Athens, Tenn. The industry was brought to the South by the industrial department of the Tennessee Electric Power Company, working in conjunction with Sidney M. Edelstein & Co., industrial engineers, Union, S. C. Construction of a factory building will start immediately. The building will contain approximately 55,000 square feet of floor space, and will either be leased for a term of years or sold outright to the new company with payments extended over a period of years. The Warwick Knitting Mills manufacture a line of woolen knitted sport wear, including sweaters, sweatercoats, knitted vests, sport hose and a large line of knitted materials used in the manufacture of overcoats, cloaks, etc.

At a meeting of the stockholders and board of directors of the Dalton Hosiery Mills, Dalton, Ga., it was voted to increase the authorized capital of the corporation to $500,000, and to change the name of the company from the Dalton Hosiery Mills to The Westcott Hosiery Mills. It was also decided to issue $100,000 seven per cent cumulative preferred stock, a portion of which will be used for expansion in buildings and machinery.

The new addition for seamless knitting production at W. B. Davis & Son, Fort Payne, Ala., has been completed. The new building is two stories, 197x62 feet. The side walls are of brick pilasters and wide sash areas. J. E. Sirrine & Company, Greenville, S. C., were the engineers.

Holston Knitting Mills, Knoxville, Tenn., will erect a concrete and steel addition, one-story, 50x130 feet.

The new plant of the Rome Hosiery Mills, Rome, Ga., has been completed, and 370 seamless machines and auxiliary equipment have been installed.

Dependable Hosiery Mills, Liberty, N. C., have been organized with a capital of $125,000. E. W. Fuller, Thomas A. Johnson, C. P. Smith, Jr., and others are interested.

The recently organized Holt Brothers Knitting Company, Burlington, N. C., will extend their original plans, and when the first installation of equipment is completed, an additional 50 machines will be installed. May Hosiery Mills is selling the product.

Cavalier Hosiery Mills, Narrows, Va., have purchased 15 additional machines from the Hemphill Company, Pawtucket, R. I.

The machinery of the Oak Lane Knitting Mills, Murphy, N. C., has been purchased by the Pannill Knitting Company, Martinsville, Va., to which place the equipment will be removed and placed in operation on children's union suits.

Juvenile Hosiery Mill, Greensboro, N. C., has been organized by Louis Baach and others. A building 62x132 feet, two-story, will be erected by the Burns-Hammond Construction Company.

The Roseknit Hosiery Company, Providence, R. I., will start operations soon in their new plant at Sumter, S. C., it is stated by Frank L. Rosenfield, Sr., president.

VaJada Underwear Company will open a plant in Charlotte, N. C., for the manufacture of infants' undergarments, women's pajamas, negligees, and lingerie. Cellulose acetate yarns will be used. F. M. Stephens is general manager.

The employees of the Maurice Mills, Thomasville, N. C., have been provided with group life, sick and accident insurance through contract with the Metropolitan Life Insurance Company.

Recent Developments by American Blower Co.

American Blower Co., Detroit, Michigan, have announced a number of recent developments, some of which are of particular interest in the textile industry. The company has brought out a new smaller size of the Venturafin unit heater, No. 2, adaptable to smaller rooms and buildings than the larger unit. The No. 2 heater delivers from 450 to 900 cubic feet of heated air per minute. The Ventura disc ventilating fan is also provided in smaller sizes with a square pressed steel plate instead of a circular frame, to eliminate the necessity for building a frame with a round opening. The blades are broad and overlapping, with a design to handle large volumes of air. The blades are riveted to a large central disc to prevent back flow of air through the center when working against pressure. The Sirocco dust collector, for solving the ash and soot nuisance in congested centers, operates on centrifugal principles, to give the centrifugal action without turbulence and without interrupting the outward and downward revolving path of the particles of solid matter in suspension on entering the collector. The Sirocco induced draft fan with evase outlet and inlet chutes, independent water jacketed pillow block bearings and split welded type housing, has the housing welded throughout, with the exception of a bolted and flanged joint along the center line which is packed with woven asbestos. This joint is made of bolted construction to facilitate assembly on the job and for facility in removing the upper half of the fan housing for cleaning and inspection. The forced draft fans are similarly constructed, except that inlet boxes are not used on these except where air heaters are used or where it is desired to bring the air to the blowers from the same outside source. Ball bearings are used on the forced draft fans.

New Skinner's Cotton Trade Directory.

The 1927-28 edition of Skinner's Cotton Trade Directory has been issued. This publication first appeared in 1923, and is most complete, covering every phase of the cotton industry in every country in the world. Substantial improvement has been made in each succeeding volume. In the present edition, the use of thinner paper and smaller type in places has resulted in a comprehensive volume that is not cumbersome or bulky. The sections of the book cover cotton statistics, raw cotton, cotton compresses and warehouses, cotton waste, spinners and manufacturers, yarns, piece goods, fabrics and their manufacturers, artificial silk or rayon, and mill supplies. It is published by Thomas Skinner & Co., of London, England. American offices are maintained at 280 Broadway, New York City, and 817 Castle Building, Montreal, Canada. The price of the book is $10.00 per copy delivered.